IRON TRADE REVIEW
Registration Applied For
The Authority of Industry National and International
Vol. LXXIII Cleveland, September 6, 1923 No. 10

Await Heavier Steel Buying

Opening of Mill Books for Last Quarter Expected To Stimulate New Tonnage—Fair Market Activity Continues as Deliveries Shorten—Coal Strike Effects Are Limited—August Pig Iron Production Again Declines

PROSPECTS for heavier fall buying of steel continue more promising and developments this week have contributed to that outlook. New bookings are well sustained at the better August rate and inquiry is showing a definite tendency to increase and broaden. Opening of mill books for last quarter tonnage while little more than a formality in the case of some heavily obligated mills, is expected to bring considerable fresh buying to a focus. The best point for the future is that consumption still is running high according to all the common tests and hold-ups remain exceptional. Easier deliveries have removed much of the pressure from the market and consumers are more assured of their requirements as they want them but the weakness that characterizes a shrinking demand is entirely absent.

Finished steel deliveries now more plainly show the effect of the maintenance of heavy shipments and production by the mills in the face of only moderate new buying. Steel bars in various sizes may be had from the larger mills within four to six weeks. Leading mills at Chicago now are making the best delivery promises in some months.

The coal strike has checked new buying and has caused some suspensions of orders by companies directly identified with the anthracite industry, but its effect on the general iron and steel market has not been important.

Foundry coke has further stiffened this week to $6 and $7 due to future buying against a possible shortage arising from a prolonged strike in the anthracite coal regions.

August Shows Iron Loss

August shows another considerable falling off in coke pig iron production to a total of 3,442,614 tons compared with 3,684,677 tons in July, a loss of 242,063 tons, or 7.03 per cent. This is the smallest monthly output since February. Daily average in August was 111,052 tons as against 118,860 tons in July. Merchant production in August declined 94,959 tons or 10.5 per cent and nonmerchant, 147,204 tons or 5.3 per cent Furnaces in blast the end of August decreased 26 to a total of 273. This shows a drop of 49 stacks from the high point of June 30.

Mill Books Opened

Firmness still is the general characteristic of steel prices. The American Sheet & Tin Plate Co. under date of Sept. 6 reaffirmed for the last quarter, its third quarter schedule on sheets and tin plate. Independent producers have acted similarly though some of them still will accept early tonnage in black sheets $2 down. This opening of books is expected to be followed by considerable buying. Some contracts for plates, shapes and bars to the year-end have been placed by buyers. A large Chicago independent has opened its books on these products for the last quarter at unchanged prices. Nut and bolt manufacturers are putting into effect new price lists to accord with the advanced extras on steel bars. A new national card of extras on bar iron, generally incorporating advances, became effective Sept. 1.

After remaining stationary for several weeks, IRON TRADE REVIEW composite of fourteen leading iron and steel products receded this week to $44.68. During the three weeks preceding the average was $44.84.

As the result of the anthracite coal strike, eastern pig iron producers hesitate to quote for fourth quarter and in cases, some have asked advances. There is such a liberal supply of iron available in furnace hands in the East and elsewhere, however, that the strike has not strengthened the market though no further weakness has developed. Buying has dropped down this week in all districts.

Roads Not Retrenching

Reports that certain railroads are disposed to curtail purchases in view of an early possibility of freight rate reductions, prove without foundation. The Pennsylvania has made a few unimportant cancellations of miscellaneous material but expects to release specifications on contracts which it recently held up. Actually the week's record of railroad buying is better. Chicago mills have taken additional orders for 80,000 tons of rails for 1924 delivery. The week's total of new car orders and repairs is heavier.

Business Trend and Chart Section Page 661

Pig Iron Market Moving Slowly

Buyers Disinclined To Purchase as Stocks Mount to Large Total in Pittsburgh and Valley District—Some Acceleration and Firming of Price Noted in East—Not Much Change Elsewhere

PITTSBURGH, Sept. 4.—Because so much pig iron now is available in this and the valley district, it is being estimated that around 350,000 tons are piled, buyers are maintaining an indifferent attitude. The market is in their hands. Prices are unchanged from a week ago and sales are spasmodic involving for the most part small tonnages. Typical orders for foundry iron are single carloads up to 75 or 100 tons at a time such as those closed in the past few days by the Phillips Iron Co., the Phillips & McLaren Co., the American Foundry & Construction Co. and the Pittsburgh Gray Iron Foundry Co., all of Pittsburgh, at $24.50 to $25, valley. A few melters have arranged for their last quarter supplies at $25 to $26, valley, one or two 300-ton lots bringing that maximum. Larger purchasers are the Westinghouse Electric & Mfg. Co., Trafford City, Pa. and the National Transit Pump & Machine Co., Oil City, Pa. The latter company divided 1300 tons evenly between a broker and a furnace operator at around $24.50, valley. The Westinghouse tonnage was divided among at least four sellers, 250 tons of No. 3 iron going at $24.50, f.o.b. Dunbar, with a freight rate of $1.39; 200 tons of No. 3 iron going to a Pittsburgh merchant furnace at $25, valley basis; another 250 tons was bought on the basis of $25, f.o.b. Scottdale for No. 2 iron with a freight rate of $1.26, and the remainder is understood to have gone to a valley furnace at around $25, valley, with $2.02 freight rate. Important inquiries now are out although some large users are expected to come into the market on or about Sept. 15. Steelmaking iron has had a particularly quiet week. In basic, nothing has occured since the purchase by the Sharon Steel Hoop Co. of 4000 tons of high silicon basic from a steel company located here on the basis of $24.50, valley. Valley producers all quote $25, valley, and are maintaining their figure on standard basic. Further information about the expected purchase by the Alleghany Steel Co., Brackenridge, Pa. of 5000 tons of basic is not forthcoming. The Monongahela Iron & Steel Co., bought 1000 tons of bessemer at around $25.50 in the Wheeling, W. Va. district, from the Wheeling Steel Co. The latter bought coke from a coke and coal affiliation of the Monongahela company. The valley market on bessemer continues to be sustained at the $26.50 figure, as spasmodic sales of carloads or 100 tons at a time are made. Average sales prices on bessemer and basic pig iron as compiled by W. P. Snyder & Co. for August were $26.50 and $25, respectively. These compare with $26.70 and $24.75 respectively for July, showing a decline of 20 cents in bessemer and an increase of 25 cents in basic. No inquiries now are out for malleable or gray forge and no recent sales are noted. The former continues to be quoted at $24.50 to $26 while on the latter a spread of $24.50 to $25.50 is noted. Copper-free low-phosphorus iron continues to be quoted at $32, valley, and only small lots are up for negotiation.

Eastern Furnaces Advance

Boston, Sept. 4.—Local dealers report several of the eastern Pennsylvania furnaces have marked up prices from a $25 to a $25.50 base in the past few days. This situation is ascribed to the abnormal conditions engendered by the strike of the anthracite miners and it is generally anticipated that a further advance will ensue if the suspension of coal production should prove to be protracted. Some of these furnaces are understood to have withdrawn from the market entirely for fourth quarter because of the coal situation. An order for 100 tons from a local dealer at $25, base price, was refused by an eastern Pennsylvania producer. So far as can be ascertained, the base price for Buffalo iron is still maintained at $25. Even at a $25.50 base, eastern Pennsylvania interests have an advantage over Buffalo in the New England market because of the freight differential. The former's delivered price being $29.15, against $29.91, for the latter. Some Virginia high-manganese iron was sold during the week. The Virginia base price is about $26.

Total sales were in the neighborhood of 4000 tons, of which one dealer contributed 2000 tons. Some western Pennsylvania iron was sold at $24.50 base with a freight of $4.91. Another dealer handled between 1000 and 1500 tons. Practically all the business of the period consisted of small lots. More inquiries are coming into the market. The largest inquiry was for 900 tons from the Howe Scales Co. of Vermont.

Better Inquiry—Firmer Price

New York, Sept. 4.—Larger and wider inquiry stiffening of prices, request for anticipation of shipments and a generally improved outlook feature the pig iron market.

Close of the vacation season and beginning of the expected fall renewal of activity apparently are combining to make the situation much better than for the past month or more. Inquiry, though mostly for small tonnages, is larger than has been the case, and sales are improving. One interest here booked 4500 tons in the past week in small lots, from 500 tons up. In addition to this new tonnage, which is practically all for September delivery, supplementing former third quarter buying, a number of melters are asking anticipation of their shipments. An inquiry for 5000 tons of basic is current, for an eastern user. Another inquiry asks 300 tons of No. 1X for fourth quarter, but quotations for that delivery are not being made by many producers. At least one important producer has increased its quotation to $25.50, furnace, on the base grade and has been selling at that figure for several days. Among the sales is 500 tons for September shipment. Nothing lower than $25, furnace, is being quoted by any furnace in this district. At Buffalo it is understood some shading of this figure has been done recently but it is believed the full price is being asked now. Expectation of the anthracite strike interfering with fuel supply and the increase in fuel prices already in effect have caused furnaces to be slow about selling into fourth quarter and has had much to do with the upward tendency of iron prices.

Market More Active

Chicago, Sept. 4.—Improvement continues in the pig iron market, though buying still lags and there is less than a real movement. Sales are largely spot and for September, though inquiry and selling for the fourth quarter are increasing. The opening of fall activity is expected to bring better business this month. One producer has nearly half its last quarter production covered. Some iron is being piled, but there are only fair stocks on furnace yards, melters' long term contracts ask full quotas for the fourth quarter. Few requests have been made to hold shipments. No plans have been made for further curtailment of production here. The market is firmer at $27, Chicago, and shading of this figure is not noted. Some makers quote a furnace price figuring slightly under this basis. Milwaukee melters are able to buy at $27, Mayville or Milwaukee furnace. The sale of 2000 tons of foundry iron on Saturday and 1000 tons on Tuesday to Chicago melters are reported. The Allis-Chalmers Mfg. Co., Milwaukee, bought 3000 tons of foundry iron for fourth quarter, and 100 tons of silveries. Low phosphorus iron is in small demand. The Milwaukee maker has sold 1500 tons for September and October at $34, delivered Chicago, for 8 per cent. Eastern makers are asking about $35, delivered, silveries are $34.50 for Jackson county, 8 per cent. Inquiry is prevailing for 3000 tons for 60 days' delivery. One thousand tons has been sold to a Wisconsin user. Lake Superior charcoal iron is $29, furnace, and demand is small.

Sales Still Small

St. Louis, Sept. 4.—While current sales of pig iron are being fairly well maintained, the volume of inquiry has fallen off. Users generally are still following the policy of dealing in the open market for what they require. Contracting continues abnormally light for this time of year. Uncertainty relative to prices still is the chief factor. Meantime, the melt holds up well, and virtually all users are pressing for

quick delivery of tonnages purchased. The largest single sale reported in the week was of 1000 tons of foundry iron to a melter in this district for September delivery by the St. Louis Coke & Iron Co. This interest reports the sale of 300 tons in small lots. One agency sold approximately 1800 tons, 500 tons of which was taken by a local foundry. Other sales reported bring the total close of 5500 tons of all descriptions. A St. Louis malleable user is inquiring for 500 tons for shipment this month, and an Illinois foundry wants 250 tons for like delivery. The trend of prices is slightly firmer. While southern iron ranges from $23.50 to $27, the amount offered at the lower figure of the spread is relatively small. Chicago is quoting $27. Nothing under that figure has been done here for 10 days or more. The leading local producer has advanced its price from $27.50 to $28.50 to $28 to $29.

Lower Prices, More Sales

Birmingham, Ala., Sept. 4.—Lower prices for pig iron have induced some buying in the Birmingham district. Quotations are at $24 for No. 2 foundry. All furnace interests are participating in the business. Sales in the past week aggregate somewhat better than they have for several weeks, but still are under production. The make has been reduced considerably. The Sloss-Sheffield Steel & Iron Co., has blown out the Hattie Ensley furnace at Sheffield and one of the city furnaces in Birmingham. The Gulf States Steel Co., is repairing its blast furnace at Gadsden, and the Tennessee Coal, Iron & Railroad Co., blew out its furnace at Bessemer which was producing ferromanganese. The Shelby Iron Co., blew out its charcoal furnace at Shelby two weeks ago. The local melt of pig iron promises to show improvement. Sanitary pipe makers have advanced prices $5 per ton, but as yet have received no business worthy of mention. The pressure pipe makers have had no reason to curtail their melt. The surplus iron on yards of furnaces in this state is estimated to be over 100,000 tons, including basic iron. Inquiries are more numerous and many small lot sales are being made. Deliveries of pig iron from this district are steady. One of the smaller furnace interests is out of the market entirely and another interest is not seeking business. This maker is caring for all demands of regular customers at $24.

Small Tonnages Sold

Cleveland, Sept. 4.—Pig iron transactions continue in moderation, with no change in prices from the levels to which the market receded a week ago. The largest tonnages sold do not measure up in size to some of those closed in recent weeks. None of the interests represented in the northern Ohio group booked anything over 1500 tons in the past week. This was the maximum amount taken by a large merchant interest whose total for the week was around 10,000 tons. Another maker booked 7000 to 8000 tons, and in all of this there was not one lot over 500 tons. Two others report sales small, as to individual lots and totals. The

(*Continued on Page* 640)

Coke Prices Are Steady

Banking of Furnaces Offsets Effect of Coal Strike—Market Holds to Last Week's Levels—More Interest in Foundry Grade

COKE PRICES, PAGE 641

Pittsburgh, Sept. 4.—Beehive coke continues to hold to the level reached last week at $5 to $5.50, ovens, despite the fact that the banking of additional blast furnaces has made more coke available. This fact doubtless has served to hold the market in check, since it was due for a further advance on the strength of demand expected because of the anthracite coal strike. So far everything above the $5.25 level is an asking price only, no deals except those involving spot carloads having gone through at the $5.50 figure. One Sharon Pa. blast furnace interest purchased requirements for the quarter at $5. A Buffalo furnace after closing on a portion of its coke at below $5 paid $5.15 for the remainder. The New Jersey Zinc Co. is understood to have filled its requirements with Connellsville coke at around $5, after purchasing 5000 tons of by-product coke monthly for the last quarter. The Wheeling Steel Corp. came in at $4.75, ovens, furnishing an interest affiliated with the coke seller bessemer iron at a figure somewhat below the going market. Several consumers of coke are holding off expecting to be able to buy at $4.75, but so far this week the $5 minimum is firm in the spot and contract markets. A number of users including the McKinney Steel Co. and the Emporium Iron Co. have bought 25 to 100 carloads at a time in the spot market at $5. Several foundries having coke coming to them on contract have asked for increased shipments. In a number of cases the excess is being stored against future emergencies. Some new buying has been done anticipating a shortage later on with a continuance of the anthracite coal strike. The market is quoted this week at $6 to $7, most of the transactions involving $6.50 or $6.75. One interest continues to quote $7.50. From $4.50 to $5.25 is full spread of the medium sulphur coke market, one sale at the maximum involving 20,000 tons. Production according to the *Connellsville Courier* for the week ended Aug. 25 was 249,710 tons as compared with 251,400 tons the preceding week.

Coke Active and Higher

New York, Sept. 4.—As a result of expectation of fuel shortage from the coal strike, coke demand has increased as users seek to accummulate stocks and prices are advancing steadily. Domestic demand is largely increased by the effort of dealers to obtain sufficient of this fuel to replace tonnage of anthracite that may be lacking and this has reacted on furnace and foundry grades. Several producers have retired from the market until conditions are clearer, and refuse to quote. No contracts for fourth quarter are being made by any producer. Sales are confined to prompt and September deliveries. While one producer is asking $7.50, Connellsville, for prompt foundry coke the range on this grade is $6.50 to $7.50, Connellsville. Furnace coke is not in demand but is quoted 50 cents to $1 higher than last week. Crushed coke is becoming scarce under present demand. Seaboard by-product coke is unchanged at $11.41, delivered, Newark and northern New Jersey.

Market Is Firmer

Cincinnati, Sept. 4.—Distinct improvement has developed in the coke market. The trade situation generally is growing tighter, quotations on domestic coke have been advanced from 25 to 50 cents a ton for September shipment. Buying for the most part is in small lots, although several inquiries are pending involving fairly large tonnages. The outstanding transaction of the week was the sale of 300 tons of Wise county foundry coke to the Peerless Mfg. Co., Louisville, Ky. An inquiry for 400 tons of Wise county foundry coke has been received from northern Ohio for September and October shipment. Sellers say Wise county foundry coke is firmer. Sales of the foundry fuel were made on a basis of $7 to $8, ovens. Producers of New River coke are practically sold up to Oct. 1, while Pocahontas coke is not a factor in this market.

Domestic Demand Improves

St. Louis, Sept. 4.—Demand for domestic coke has improved during the past ten days. Producers and dealers report an excellent inquiry. It is estimated that only about 20 per cent of domestic buying has been done to date, while normally from 35 to 40 per cent has been covered by this time. Prices are a shade firmer, and an advance in domestic sizes is looked for next week. Connellsville coke is scarcer than heretofore, and 25 cents a ton higher, ranging from $6.50 to $7.75 per ton. Local by-product plants are asking $9.50 for domestic coke. A sale of 600 tons of foundry coke to an Illinois manufacturer of heating apparatus is reported.

Operating at Capacity

Boston, Sept. 4.—New business has not been especially active in the coke market during the past week. The ovens of the Everett and Providence producers are operating at capacity to meet the orders already on their books. New England ovens still quote foundry coke at $13.50, delivered, and domestic product is unchanged from last week at $14.50, delivered. The requirements of the foundries have been well taken care of. Comparatively little Connellsville coke is coming into New England and not much is expected unless the anthracite situation assumes serious proportions. Beehive coke is quoted locally at $5.50 to $6 for furnace and $7 to $7.25 for prepared domestic sizes, which represent an advance of $1.50 to $2 in the past two weeks. Connellsville foundry is unchanged at $6.50 to $7. Some consumers of New England by-product coke are requesting the ovens to send them two to three times their normal indicating a desire to stock up.

Market Moving Slower

(*Continued from Page 639*)

week's sales by the interests in the northern Ohio group total around 25,000 tons. This does not include any basic iron, no sales of which have been concluded since those reported last week. Inquiry for foundry grades involves small lots, though it is more brisk. Cleveland furnaces continue to book small tonnages at $25.50 for local delivery, taking a 50-cent freight rate. Quotations on business for nearby territory have ranged this week from $24.50 to $25.50 lake furnace. A melter at Bucyrus, O., closed for a small lot. Interests in the northern Ohio group are quoting $25, valley and $25, Buffalo. The price in southern Ohio has been reduced on some business to $25 by the same maker asking $26 a week ago. Shipments of pig iron are holding up well, and more melters are close to the time when they will have to bargain for larger amounts. The Dover, O., furnace of M. A. Hanna & Co., is about to be banked or blown out.

Strike Restrains Offerings

Philadelphia, Sept. 4.—As the result of the hard coal strike and its psychological effects, eastern furnace operators are showing a tendency to stop selling pig iron for fourth quarter. One maker refuses to quote for fourth quarter and others are disposed to go slow. In the meantime there is plenty of iron obtainable and indications are that stock piles at furnaces increased considerably during August. Therefore no signs are present of any immediate strengthening effect on pig iron due to the strike. Most furnaces now are asking $25.50 base furnace plus 50-cent silicon differentials but lower still can be done on attractive tonnages. Foundry iron demand is slow although the business is larger than appears on the surface. An eastern furnace booked at least 10,000 tons of foundry iron the past week. A round tonnage of basic was sold at an unchanged price of $25 to $25.25, delivered eastern Pennsylvania. The phosphorus situation is easier. Copper-bearing iron was sold the past week at $28 furnace which now represents the markets. The copper-free low phosphorus iron market here now is dominated by English iron. English iron of this grade on hand here in Philadelphia is obtainable at $29.50 duty paid tidewater while September shipment can be obtained from England at $28.50 duty paid tidewater. Sales of low phosphorus iron the past week aggregated at least 3000 tons. Virginia foundry iron now is $25 base furnace plus 50-cent silicon differentials.

Sales Volume Is Heavier

Cincinnati, Sept. 4.—Increased activity is noted in the pig iron market. Sales the past week, exceed those of any previous week in August, while the total volume of business for the month surpasses that for July by a wide margin. In addition to sales, the inquiry especially for small lots has developed distinct improvement. Prices, however, continue to show weak tendencies. Owing to this unsatisfactory condition, the Belfont and Norton furnaces have withdrawn from the market. Two furnaces in the Birmingham district who for several months have been quoting $27, base now are naming $24 base. The southern market ranges from $23.50 to $27, base, although actual sales are at $23.50 to $24. The $23.50 quotation per tains to the product of Tennessee furnaces. The southern Ohio market now ranges from $25 to $26, Ironton base.

The bulk of the business at present involves small tonnages. The B. F. Avery & Son Co., Louisville, has closed for 500 tons if southern and the Lunkenheimer Co., Cincinnati for 300 tons of southern and 300 tons of northern for shipment this month. The Louisville business went to an Alabama furnace at a price said to be $24.50 base. A southern Ohio furnace interests reports sales of 1000 tons of northern iron to an Ironton, O., melter and 1000 tons of the same grade to a consumer in this city. Inquiries involving approximately 1500 tons of northern iron are pending. Two negotiating for 300 tons of northern individual melters at Hamilton O., are iron each, while a Louisville consumer is likely to take a like tonnage.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Sept. 5 1923	Aug. 1923	June 1923	Sept. 1922
PIG IRON				
Bessemer, valley del. Pitts....	$28.27	28.07	30.27	35.27
Basic, valley	25.00	25.00	27.35	34.27
Basic, eastern del., eastern Pa...	25.10	25.18	28.14	30.00
*No. 2 foundry, del. Pitts.....	26.27	26.47	29.52	37.02
*No. 2 foundry, Chicago.....	27.00	27.12	31.50	32.00
*Southern No. 2, Birmingham..	23.50	23.60	26.75	26.25
*Southern Ohio, No. 2, Ironton.	25.00	26.00	28.25	33.75
**No. 2X, Virginia furnace	25.50	26.35	28.00	33.00
***No. 2X, Eastern del., Phila	26.26	25.76	30.60	34.25
Malleable, valley	24.50	24.70	28.25	34.00
Malleable, Chicago	27.00	27.12	31.50	32.00
Lake Superior charcoal, Chicago	32.04	32.04	36.65	36.15
Gray forge, val. del. Pittsburgh	26.27	26.27	29.02	36.02
Ferromanganese, del. Pitts....	117.29	122.29	129.79	80.59
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	42.50	42.50	42.90	39.50
Sheet bars, open-hearth, Pitts....	42.50	42.50	42.90	39.50
Billets, bessemer, Pittsburgh....	42.50	42.50	42.90	39.50
Billets, open-hearth, Pittsburgh..	42.50	42.50	42.90	39.50
FINISHED MATERIAL				
Steel bars, Pittsburgh.....	2.40	2.40	2.40	2.00
Steel bars, Chicago	2.50	2.50	2.50	1.98
Steel bars, Philadelphia.....	2.72	2.72	2.75	2.38

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon

	Sept. 5 1923	Aug. 1923	June 1923	Sept. 1922
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia	$2.72	2.72	2.72	2.33
Iron bars, Chicago mills	2.50	2.50	2.60	2.25
Beams, Pittsburgh	2.50	2.50	2.50	2.00
Beams, Philadelphia	2.82	2.82	2.82	2.38
Beams, Chicago	2.60	2.60	2.60	2.08
Tank plates, Pittsburgh	2.50	2.50	2.50	2.20
Tank plates, Philadelphia	2.82	2.82	2.85	2.58
Tank plates, Chicago	2.60	2.60	2.60	2.08
Sheets, blk., No. 28, Pittsburgh.	3.75	3.85	3.85	3.40
Sheets, blue anl., No. 10, Pitts.	3.00	3.00	3.00	2.50
Sheets, galv., No. 28, Pittsburgh	5.00	5.00	5.00	4.40
Wire nails, Pittsburgh	3.00	3.00	3.00	2.70
COKE				
Connellsville furnace.....	5.00	4.45	4.65	11.00
Connellsville foundry, ovens.....	6.00	5.20	5.50	12.75
OLD MATERIAL				
Heavy melting steel, Pittsburgh.	18.50	17.50	20.50	19.50
Heavy melting steel, eastern Pa..	16.50	16.05	18.65	17.10
Heavy melting steel, Chicago ..	16.75	16.31	17.75	18.15
No. 1 wrought, eastern Pa....	17.50	17.50	22.75	21.25
No. 1 wrought, Chicago	18.50	16.56	16.95	19.95
Rails for rolling, Chicago	18.25	17.81	19.40	19.40

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago

Sept. 5, 1923	August 29, 1923	August, 1923	June, 1923	September, 1922	September, 1913
$44.68	$44.84	$44.87	$46.46	$43.79	$25.55

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Iron and Steel Prices

SCRAP PRICES, PAGE 700, WAREHOUSE PAGE 692, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 696

Pig Iron

Bessemer, valley	$26.50
Bessemer, Pittsburgh	28.27
Basic, valley	25.00
Basic, Pittsburgh	26.77
Basic, Buffalo	24.00 to 24.50
Basic, del. eastern Pa.	25.00 to 25.25
Malleable, valley	24.50 to 26.00
Malleable, Pittsburgh	26.27 to 27.77
Malleable, Chicago	27.00
Malleable, Buffalo	25.00
Malleable, del., eastern Pa.	26.25 to 26.75

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.23
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	26.76 to 27.26
No. 1X, Buffalo	26.50
No. 2 foundry, valley	24.50 to 26.00
No. 2 foundry, Pittsburgh	26.27 to 27.77
No. 2 foundry, Buffalo	25.00
No. 2 foundry, Chicago	27.00
No. 2 foundry, Granite City	27.50 to 28.00
No. 2 foundry, Ironton fur.	25.00 to 26.00
No. 2 foundry, Cleveland del.	26.00
No. 2, foundry del. Phila.	25.76 to 26.26
No. 2 foundry, N. J. tidewater	26.13 to 26.76
No. 2X, eastern del., Phila.	26.26 to 26.76
No. 2X, east. N. J. tidewater	26.63 to 27.26
No. 2X, eastern del. Boston.	29.65
No. 2X foundry, Buffalo, fur.	25.50
No. 2X, Buffalo, del. Boston.	30.41
No. 2 southern, Birmingham.	23.50 to 27.00
No. 2 southern, Cincinnati	27.55 to 28.05
No. 2 southern, Chicago	29.51 to 30.01
No. 2 southern, Philadelphia	31.30 to 31.80
No. 2 southern, Cleveland	29.51 to 30.01
No. 2 southern, Boston (rail and water)	30.41 to 30.91
No. 2 southern, St. Louis	28.67 to 29.17
No. 2X, Virginia furnace	25.50
No. 2X, Virginia, Phila.	30.77
No. 2X, Virginia, Jersey City	31.04
No. 2X, Virginia, Boston	31.42
Gray forge, eastern Pa.	25.00 to 25.25
Gray forge, val. del., Pitts.	26.27
Low phos., standard, valley	32.00
Low phos., standard, Phila.	32.79
Low phos., Lebanon furnace	28.00
†Low phos. English tidewater	29.26 to 30.26
Charcoal, Birmingham	34.00
Charcoal, Superior, Chicago.	32.04

Silvery Iron

Jackson County, Ohio, furnace

7 to 8 per cent	$33.00
8 to 9 per cent	34.50
9 to 10 per cent	36.50
10 to 11 per cent	38.50
11 to 12 per cent	41.00
12 per cent	43.50

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 to 11 per cent	$43.50
11 to 12 per cent	46.00
12 to 13 per cent	48.50

Ferroalloys

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	$110 to 112.50
Ferromanganese, delivered, Pittsburgh	114.79 to 117.29
Spiegeleisen 19 to 21 per cent furnace or tidewater	45.00 to 47.50
Ferrosilicon, 50 per cent contract freight allowed	82.50 to 87.50
Ferrotungsten standard, per pound contained	88.00 to 90.00
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon per pound contained, delivered	12.00
Imported ferrochrome, 4 to 6 per cent carbon	nominal
†Duty paid.	
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.50
Ferro carbon-titanium, carloads, producer's plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$5.00 to 5.50
Connellsville foundry	6.00 to 7.00
New River furnace	8.00 to 9.00
New River foundry	11.00 to 11.50
Wise county furnace	5.25 to 6.25
Wise county foundry	7.00 to 8.00
Alabama furnace	7.00 to 7.50
Alabama foundry	7.50 to 8.00

By-Product

Foundry, Newark, N. J., del.	$11.34 to 11.41
Foundry, Chicago, ovens	13.50
Foundry, Boston, delivered	13.50
Foundry, Granite City, Ill.	13.00
Foundry, Alabama	7.75 to 8.50

Semifinished Material

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$42.50
Open-hearth, Youngstown	42.50
Open-hearth, Philadelphia	47.67
Bessemer, Pittsburgh	42.50
Bessemer, Youngstown	42.50
Forging, Pittsburgh	47.50
Forging, Philadelphia	52.67

SHEET BARS

Open-hearth, Pittsburgh	$42.50
Open-hearth, Youngstown	42.50
Bessemer, Pittsburgh	42.50
Bessemer, Youngstown	42.50

SLABS

Pittsburgh	$42.50
Youngstown	42.50

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh $51.00

Standard extras, $2.50 per ton over ¼ inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	2.40c to 2.45c
Universal skelp, Pittsburgh	2.40c to 2.45c
Sheared skelp, Pittsburgh	2.40c to 2.45c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.50c
Structural shapes, Phila.	2.72c to 2.82c
Structural shapes, New York	2.74c to 2.84c
Structural shapes, Chicago	2.60c
Tank plates, Pittsburgh	2.50c
Tank plates, Philadelphia	2.82c
Tank plates, New York	2.84c
Tank plates, Chicago	2.60c
Bars, soft steel, Pittsburgh	2.40c
Bars, soft steel, Philadelphia	2.72c
Bars, soft steel, New York	2.74c
Bars, soft steel, Chicago	2.50c to 2.74c
Bars, refined iron, Pittsburgh	3.25c to 5.00c
Bars, rail steel, Chicago	2.30c
Reinforcing bars, Pittsburgh	2.30c to 2.40c
Bar iron, common, Phila.	2.72c
Bar iron, common, New York	2.74c
Bar iron, common, Chicago	2.40c to 2.45c
Bars, forging quality, Pitts.	2.65c

Hoops, Bands, Shafting

Hoops, Pittsburgh, large	3.15c
Hoops, Pittsburgh, small	3.50c
Bands, Pittsburgh	3.15c
Cold finished steel bars, Pittsburgh base	3.25c
Steel shafting, Pittsburgh	3.25c
Cotton ties, bundle 45 lb. Pittsburgh	$1.63

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	30.00 to 35.00
Relaying rails, Pittsburgh	30.00 to 34.00
Light rails, 25 to 45, mill	2.25c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	3.15c
Spikes, small railroad, Pitts.	3.50c to 3.75c
Spikes, boat and barge, Pitts.	3.50c to 3.75c
Spikes, railroad, Chicago	3.25c
Track bolts, Pitts. Standard	4.00c
Track bolts, Pitts., small	4.75c to 5.00c
Track bolts, Chicago	4.25c
Tie plates, Pittsburgh	2.60c
Tie plates, Chicago	2.60c

Spike, tie plate and truck bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Wire nails, Pittsburgh	3.00c
Galv'd nails, 1-inch and over	5.25c
Plain wire, Pittsburgh	2.75c
Annealed wire, Pittsburgh	2.90c
Galvanized wire, No. 9 gage, Pittsburgh	3.35c
Barbed wire, painted, Pitts.	3.45c
Barbed wire, galv., Pitts.	3.80c
Polished staples Pittsburgh	3.45c
Galvanized staples Pittsburgh	3.80c
Coated nails, count keg, Pittsburgh	2.70c
Woven wire fencing (retailers)	65 off
Woven wire fencing (jobbers)	67½ off

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts.	6.50c
Sheet piling base, Pittsburgh	2.55c
Hot rolled strip steel, Pittsburgh stamping quality	3.15c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, 0.100-inch and heavier, base	5.00c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	3.75c to 3.85c
No. 28, bessemer, Pitts.	3.75c to 3.85c
No. 28, open-hearth, Phila.	4.07c to 4.17c
No. 28, open-hearth, Chicago.	4.09c to 4.19c

TIN MILL, BLACK

No. 28, open-hearth, Pitts.	3.85c
No. 28, open-hearth, Chicago	3.84c

GALVANIZED

No. 28, open-hearth, Pitts.	5.00c
No. 28 bessemer, Pittsburgh	5.00c
No. 28, open-hearth, Phila.	5.32c
No. 28, open-hearth, Chicago	5.34c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.00c
No. 10 bessemer, Pittsburgh	3.00c
No. 10, open-hearth, Phila.	3.32c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	5.35c

Tin Plate

Per 100 lb. box

Tin plate, coke base, Pitts.	$5.50

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	63.20 to 65.20
Six-inch and over, Chicago	59.20 to 61.20
Three-inch, Birmingham	59.00 to 60.00
Four-inch, Birmingham	53.00 to 54.00
Six-inch and over, Birmingham	49.00 to 50.00
Four-inch, New York	68.60
Six-inch and over, New York	63.60

Standard fittings, Birmingham, base, $110.00 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B.

Scrap Prices Still Gain

Increased Inquiry and Sales Reflected in Further Advances in Quotations—Stocks in Dealers' Hands Are Lower

SCRAP PRICES, PAGE 700

Chicago, Sept. 4.—After the buying spurt in the scrap market reported a week ago there followed a dull period for a few days, but now both inquiries and sales are reported in demand again. A Wisconsin consumer recently bought 2000 tons of borings at $12.50. A steel foundry took 400 tons of low phosphorus scrap and many iron foundries have been in the market for small lots of the cast grades. Prices have practically all been advanced 50 cents in the trading of the last four or five days, this being the second advance within the week.

Railroad scrap offerings are heavy. The Pennsylvania system for its various regions is offering 33,000 tons. The Michigan Central, the Big Four and the New York Central railroads each have issued blank lists. Short steel rails have been selling in fairly large volume in the Milwaukee district. Several steel companies including the Steel & Tube Co. of America, are inquiring for heavy melting steel.

Better Feeling Among Dealers

Boston, Sept. 4.—An unmistakably better feeling is shown among scrap dealers and opinions are ventured that the turn in the market has come. Local melters are buying little, despite the firmer tendency in prices. They appear to be content to wait until demand is more active before making commitments. A number of inquiries are coming out; but they are at prices the dealers cannot meet. The price of heavy melting steel has stiffened from $11.50 to $12 to a spread of $12.50 to $13 and short steel rails have advanced commensurately. Stove plate remains unchanged at $16.50 to $17. A moderate buying movement has been observed in wrought pipe which has lifted prices from a $10 to $10.50 basis to a spread of $11 to $12. Chemical borings are quoted at $12.50 to $13 but they appear to be a drug on the market at the moment. The Watertown arsenal sold various lots of old material during the past week, some of which was in the form of ingots.

Demand Due to Improve

New York, Sept. 4.—Scrap dealers discounted the dullness of the past week as being due in part to the holiday yesterday and prices were maintained firmly. Virtually all believe that demand is due for an improvement and the prices will move upward if anything. However, they look for no marked advance in the near future. Trading in heavy melting and No. 1 railroad steel continues to comprise the bulk of current business. All the larger eastern Pennsylvania consumers are paying $16, delivered. Cast scrap is moving in fair quantity, but the rolling mill grades are sluggish. This applies particularly to No. 1 wrought and shafting. Borings and turnings, although in little demand by the rolling mills, are moving in fair volume to the blast furnaces.

Some Grades Advanced

Cincinnati, O., Sept. 4.—While some slight advances in quotations on iron and steel scrap have been noted they represent changes in sentiment to a great degree. Prices generally are stationary and demand has not increased, though an underlying feeling of strength is noted. Considerable inquiry has appeared and while it has not broadened into a large volume of buying as yet, indications are that important tonnage is to be placed within the next month. Dealers are buying freely for laying down in their yards and all recent railroad lists have been easily absorbed. Prices which have been on a declining movement for the past several months have reversed their course. During the past week, prices on a number of the grades advanced 50 cents.

Actual sales involve small tonnage. Most of the recent business included heavy melting steel and this grade now is bringing around $14.50 f.o.b. consuming points. Railroad offerings are small as most of the important lists have been closed. The Louisville & Nashville closed a list aggregating 8000 tons which went to St. Louis, Cincinnati, Louisville and Knoxville melters.

Demand Is Improved

St. Louis, Sept. 4.—The market for scrap iron and steel is featured by a slight improvement in demand, especially for steel specialties, rolling mill material and foundry grades. Activity at the foundries is at a higher level than expected and stocks of raw materials in a number of instances are light. Reserves at some plants are low, and it has been necessary to buy small tonnages to fill in with. The principal buying activity, is among the dealers to restock their yards. The belief among sellers is that the end of September will witness a revival of scrap buying on a real scale, and they are preparing material to meet the anticipated demand. All railroad lists during the past three weeks have been readily absorbed, and prices realized were relatively high. Current prices as indicated by dealers lists hold steady. A number of small railroad lists are before the market, but the only ones of size are from the Pennsylvania as follows: Central region, 10,000 tons; Northwestern region, 3000 tons and Southwestern region, 5200 tons.

Scrap Market Still Quiet

Birmingham, Ala., Sept. 4.—No demand is noted in the scrap iron and steel market here, the tonnage that is moving being against old contracts. Heavy melting steel dealers have been asked to bid on a considerable tonnage but purchasing will be deferred for the time being. Railroads are turning in their old wheels to wheel producers on account. Old material dealers have curtailed their efforts in the assortment and preparation of scrap. Quotations are lower. Chattanooga recently made some inquiries for old material but did not purchase extensively.

Melters Evidence Little Interest

Pittsburgh, Sept. 4.—Melters of scrap are evidencing little or no interest in the open market, notwithstanding widespread expectations on the part of sellers that by now considerable buying would be transpiring. A wider spread exists on heavy melting steel this week than last since some purchases by dealers have been made at as low as $18 while others have offered and paid as high as $19 to cover shorts on some of their high-priced business. Since numerous short interests remain to be covered, it is thought that relatively high prices will be bid on the railroad lists due this week.

Less scrap is apparently being gathered and assorted since these lists are smaller this month than for many months past. For instance the Pennsylvania railroad lists aggregate around 35,000 to 40,000 tons instead of 45,000 to 50,000 tons. Its eastern region list, totaling 16,500 tons, is about 5000 tons smaller than last month's. Occasionally a scrap sale is consummated in the open market involving from a single carload up to 1000 tons at a time in the different grades. These are relatively unimportant, except in the aggregate. Yard stocks of dealers are not overcrowded due to the high current prices which militate against scrap accumulation. Several grades again are marked upward from 50 cents to $1 per ton this week, including specialties for which more inquiries now are current than for any other grade.

Demand Lacks Volume

Philadelphia, Sept. 4.—Demand for iron and steel scrap was somewhat heavier last week although the business continued to lack volume. Three mills during the past week bought heavy melting steel aggregating about 5000 tons at prices ranging from $16 to $17.50, delivered. Some wrought pipe and some bundled sheets were sold, otherwise the market was generally quiet.

More Interest Being Shown

Buffalo, Sept. 4.—More interest is being shown in the iron and steel scrap markets here, although no good sized orders have been placed recently. Out of town inquiry is improving. The offering price by local mills for heavy melting steel is $17, but buyers are unable to purchase large quantities at this price. Dealers are holding for $19. The interest in the prices of other grades continues passive.

More Interest

Is Shown by Consumers of Ferroalloys —Ferromanganese Sales at $112.50

FERROALLOY PRICES, PAGE 641

Pittsburgh, Sept. 4.—Tangible evidence of increasing interest is at last commencing to show itself in connection with ferroalloys. So far this is confined more or less to ferromanganese although in spiegeleisen too, demand is on the increase. During the

past few days sales of ferromanganese in this vicinity have aggregated at least 1500 tons and the largest individual lot involves 500 tons. Practically all these transactions carry the $112.50 figure and some of the 1000-ton remainder at the same price, is understood to be foreign ferromanganese which has been held in stock for several weeks. Since the $117.50 figure has disappered, it means that the market has been reduced $5 per ton and while buyers are in the mood where even lower prices are anticipated, these may not now materialize in view of increasing fuel costs, etc.

In spiegeleisen, several inquiries lately have come to light for around 100 tons each, and one or two sales of that size have been closed at $45 furnace. The American Manganese Mfg. Co., now is understood to be producing spiegeleisen and is quoting $45 furnace, on 18 to 22 per cent material; other sellers are naming the same figure except on all lots for which $47.50 is being obtained on the 19 to 21 per cent grade.

Practically no interest is being shown in ferrotungsten, ferrochrome or ferrovanadium although occasionally buying of ferrosilicon is being done. One sale of 50 tons of 15 per cent ferrosilicon was made this past week around $47.50, Pittsburgh. The 50 per cent grade still is quoted at $82.50, delivered.

Slack Demand in East

New York Sept. 4.—With the exception of an inquiry for 150 tons of spiegeleisen from a Chicago user, for October delivery, and a few carlots, the market for this alloy is continuously dull. Eastern sellers are sold well into fourth quarter and most users are well covered. The price appears to be steady at $45, eastern furnace, for contracts and $47, furnace, for carloads. Ferromanganese is in no demand, with the quotation ranging from $115, seaboard, to $125. One important seller is taking tonnage at $120, seaboard.

Resale Lots Go at $110

Philadelphia, Sept. 4.—All first hands now are quoting $112.50, tidewater duty paid on ferromanganese which represents a $5 reduction. Demand for ferromanganese in carload and 100-ton lots is improving. Some of this is being satisfied at the $112.50 price while some resale business is going at $110. Several hundred tons of spiegeleisen have been sold at $45, furnace for 20 per cent. The Dunbar, Pa., furnace continues on foundry iron but will switch soon to spiegeleisen.

Survey 8-Hour Plans

Canton, O., Sept. 4.—A study of industrial conditions in the plant of the United Alloy Steel Corp. preparatory to consideration of the 8-hour day for its employes generally is now being made, according to General Manager Charls. A policy will not be determined until after careful checking of data submitted by efficiency.

Owners of over 50 per cent of the stock of the Universal Crane Co., Elyria, O., have assented to a reorganization whereby the property and control will pass to the Automatic Shovel Co., Lorain, O.

Billets and Slabs Placed

Price of $42.50 Done on Round Tonnages for Delivery Up to End of Year—More Interest in Market—Sheet Bar Sales Lacking

SEMIFINISHED STEEL PRICES, PAGE 641

Pittsburgh, Sept. 4.—Belief is widely expressed that prices on semifinished material such as sheet bars, billets and slabs for the fourth quarter will show no change and that the $42.50, Pittsburgh or Youngstown, level will hold. It is further stated that some buyers who have been paying $40 on old contracts will be faced with the necessity of lining up under the $42.50 level for October. Producers of semifinished steels point to the increased production costs as the reason for maintaining that figure, if it is not possible to inaugurate an advance at this time. While an occasonal billet inquiry is circulated, it is not always followed by buying action. Skelp is quoted at 2.40c, base Pittsburgh. The majority of the forging billet users have all the material they desire, either in stock or coming to them on contracts. No new inquiries are current and the $47.50 figure is at present practically untested. Wire rod users endeavor to place tonnage from time to time but rarely is a location found where excess tonnage remains after the mills' own finishing departments are supplied. The base price still is unchanged at $51.

Expect $42.50 To Continue

Youngstown, Sept. 4.—Since sheet bars are holding firmly at $42.50 it is believed this price will prevail for the fourth quarter on sales to be made during this month and this tends to keep sheets and tin plate prices steady.

Billet Situation Unchanged

New York, Sept. 4.—Demand for billets, both rerolling and forging, is almost absent from the market and nominal quotations are $42.50, Pittsburgh, for the former and $47.50 for the latter. Practically no inquiry is being received. Wire rods remain fairly active at $51, Pittsburgh, continued demand for wire and nails causing producers to continue heavy consumption of rods. Producers could handle a larger tonnage of this material and expect increased demand for fourth quarter shipment.

Eastern Business Small

Philadelphia, Sept. 4.—Billet business in the past week was small. Current inquiry is limited. Prices are unchanged $47.50, Pittsburgh, for forging quality, and $42.50, Pittsburgh, for rerolling.

Billets and Slabs Sold at $42.50

Cleveland, Sept. 4.—The market for semifinished material is much more active than it has been for a number of weeks, and some business has been transacted this week which affords a better view of the price situation. The leading maker in this district has booked for one consumer 6000 tons of billets and slabs for each of the remaining four months of the year, a total of 24,000 tons at $42.50, mill. Another buyer closed with this maker for 8000 tons of billets for delivery in the four months at $42.50, valley. Several offers of tonnages below this price were refused. The market is regarded as firm at $42.50. It has been supposed that if any weakness developed, billets and slabs would be the first to give indication. Considerable business is pending. There have been no further sales of sheet bars, on which a price has been named, since the sale of more than 1000 tons in this district a week ago at $42.50, mill, but buyers are interested in the market and some negotiations for tonnage are underway.

Wire and Nail

Demand Still Heavy—Makers Trying to Catch Up on Deliveries

WIRE PRICES, PAGE 641

Pittsburgh, Sept. 4.—With operations on a relatively high plane, and new buying limited, books of the wire products makers are rapidly being cleared of some of the obligations hanging fire. Delivery dates are brought nearer and conditions are more satisfactory. Jobbers are anxious to increase their stocks to meet fall demands and consequently are pressing the mills for further deliveries. These latter are operating on the basis of 65 to 75 per cent of capacity on the average. While of late new buying has been slow, all signs point to a resumption of activity in this regard within a short time. Considerable mixed carload business is expected to develop from the farmer trade within the next month and in the meantime orders for nails and plain wire are fairly numerous. Plain wire is priced at 2.75c, base Pittsburgh, while the prices on nails follow: Wire nails, 3.00c; galvanized nails, 1-inch and over, 5.25c; cement-coated nails, 2.70c per count keg; and cut nails per keg, 3.25c.

Can Not Meet Delivery

New York, Sept. 4.—Though wire mills are increasing production and expect to be on a much better basis through the present month they are not able to catch up on deliveries, which continue much deferred. At the same time demands holds well and buying is being done steadily. Nails are especially in demand, Prices are steady at 2.75c Pittsburgh, for wire and 3.00c Pittsburgh, for nails.

Demand For Barbed Wire

Chicago, Sept. 4.—A better demand for barbed wire has developed during the past week. This comes principally from Iowa and other states in the Southwest. In the North and Northwest the fencing trade is dull. The industrial centers continue to call for nails and jobbers especially report heavy sales. The nail turnover as a whole, however, has fallen off somewhat during the week. Barbed wire and wire netting sales have shown a slight improvement.

Bar Demands More Active

Hard and Soft Steel Bars Being Sold for Fourth Quarter—Deliveries With Larger Mills Ease Up

BAR PRICES, PAGE 641

Chicago, Sept. 4.—The soft steel bar market continues encouragingly active and an increasing demand is reported from jobbers and implement manufacturers. The already good demand from railroads, automobile manufacturers and others, continues unchanged. During the past week a fairly large tonnage was placed in this market with Pittsburgh district manufacturers at 2.40c, Pittsburgh, which means 2.74c, delivered, and this shows the strength of the market when local producers are quoting 2.50c Chicago. The leading independent is offering bars for last quarter at 2.50c, Chicago.

Bar iron holds at a 2.40c, Pittsburgh base, with business unchanged. Mills fail to develop backlogs, but have sufficient current orders to keep operations full.

The new classification card of extras on iron bars and bands is effective Sept. 1. Rail steel trading is somewhat sluggish. The price holds at 2.30c, and reinforcing bars are moving along moderate lines but other than this recent sales have declined.

Tonnage Sold Is Smaller

Boston, Sept. 4.—The tonnage of steel bars sold in this section in the past week was smaller than that in the preceding similar period. Inquiries are also said to have been lighter. The price held firm at 2.40c, Pittsburgh base, and the trade is not anticipating any change from that level for the time being at least.

Demand Continues Steady

New York, Sept. 4.—Better demand for steel bars than for shapes is coming to mills. Consumers in a wide variety of lines are in the market for small lots to supplement their regular tonnages and some inquiry for fourth quarter is also coming out. The market is firm at 2.40c, Pittsburgh, without shading.

Specifications Relatively Heavy

Pittsburgh, Sept. 4.—Relatively heavy specifications are being received by the producers of hot-rolled merchant steel bars. Interest is high and the general expectation is that prices will not now change from the 2.40c, base Pittsburgh figure, which continues to represent the market. Prompter deliveries now can be obtained in several directions, which means that makers have made progress in discharging their obligations. Bar mills are working on the basis of 80 per cent of capacity, on the average, and some now are running practically full, particularly in the Youngstown, O., district. New buying is limited although the inquiry rate is good, coming from diversified lines of industry.

Spasmodic buying takes place in refined iron bars but users are not purchasing ahead to any great extent, limiting their purchases to immediate needs. Prices run all the way from 3.25c to 5.00c, base Pittsburgh, according to the degree of refinement desired.

Mill Deliveries Ease Up

Cleveland, Sept. 4.—Deliveries on steel bars reflect some material easing up in the position of the mills and on certain forms and sizes now may be had in from four to six weeks. The widest assortment that can be furnished under this schedule is in flats, though in rounds and squares also deliveries have been considerably shortened. The business is in fair volume. Rivet manufacturers especially are anticipating heavy requirements for the last quarter and are making arrangements for these although their immediate specifications have shown some falling off. In a few cases buyers are contracting at the prevailing price, 2.40c, Pittsburgh, for the remainder of the year, some of them feeling there may be an advance in price. Some of the mills indicate such a probability on account of the increased costs incident to the inauguration of the 8-hour day. Prices are steady but some producers which have been asking 2.50c Pittsburgh on structural bars now are accepting 2.40c.

Prices Continue Firm

Philadelphia, Sept. 4.—Demand for steel bars continues fair, but bookings do not equal shipments. The price is still firm at 2.40c, base Pittsburgh, equivalent to 2.72c, Philadelphia.

Cold Drawn Orders Pleasing

Pittsburgh, Sept. 4.—Satisfactory orders from a tonnage standpoint continue to find their way to the books of the cold-drawn steel bar makers here. These are booked up on small sizes so that six or eight weeks deliveries alone can now be had. On the larger sizes the condition is somewhat easier. While less-than-carload orders are fairly numerous, a fair sprinkling of carload lot business is enjoyed, together with occasional larger tonnages. One customer recently specified 300 tons at one time. The cold-drawn bar price is unchanged at 3.25c, base Pittsburgh.

Buying Bolts and Nuts For Fall Trade

NUT AND BOLT PRICES, PAGE 696

Pittsburgh, Sept. 4.—Due to anxiety of makers of nuts, bolts and rivets to obtain their full share of what business is current, prices lately have not been firm. Departures from the published discounts are not infrequent and the trade now is distributing new lists as of Sept. 1. Small orders are the rule although all makers have fair sized backlogs of tonnages and these are operating fairly full. Several single carload orders for rivets are received each week by each producer. The single list price on rivets is understood to be 3.25c, although as has been the case for some time past on attractive business, including single carloads, the 3.00c base Pittsburgh figure is being named.

New List Adopted

Cleveland, Sept. 4.—Some improvement in demand for bolts and nuts is reported although shading of quoted prices still is being done to meet competition. The new list of bolt and nut quotations became effective Sept. 1, and all new business is based on these prices. The list now is being printed and will be mailed to buyers within a few days.

Rivet prices on spot business are weak, being shaded from $2 to $4 a ton, according to the size of the tonnage. Little current business is reported. Specifications against contracts are reported slightly heavier. Contract business brings the regular quoted prices.

Buy for Fall Stocks

Chicago, Sept. 4.—Increased buying of bolts and nuts is reported for the past week. This is due partly to a tendency on the part of jobbers to stock up for the fall and partly because of a new list on extras effective Sept. 1, which created a desire to close pending business during August. The new list carries advances in many sizes. Stocks both in the hands of manufacturers and dealers are reported low.

Hoop Deliveries Called For

HOOP PRICES, PAGE 641

Pittsburgh, Sept. 4.—Calls for deliveries of hoops and bands on order are being made upon the hoop and band makers. They are filled up for six or eight weeks ahead although great progress lately has been made in the discharge of obligations so that fairly prompt deliveries can now be promised. Hoops and bands are quoted at 3.15c, base Pittsburgh, small hoops remaining unchanged at 3.50c, base Pittsburgh.

Strip Order Books Large

STRIP PRICES, PAGE 641

Pittsburgh, Sept. 4.—Gaged by order books, demand for both hot and cold-rolled strip steel continues to be of good proportions and more satisfactory deliveries are being made. Present demand is from diversified sources of use over a widespread territory and represents a healthful market condition. Most makers are booked up for several weeks to come on a 70 to 80 per cent operating basis. The price of cold-rolled strip remains unchanged at 5.00c, base Pittsburgh, while the general market on hot-rolled is quotable at 3.15c although 3.00c base Pittsburgh, has appeared in some directions on hot strips purchased by cold rollers.

Ore Shipments Large

ORE PRICES, PAGE 696

Cleveland, Sept. 4.—Shipments of iron ore from the Lake Superior district in August continued in large volume, the total being 10,296,133 tons compared to 10,411,248 in July. The record for a month's shipment is 10,659,000 tons in

July, 1918. The movement for 1923 to Sept. 1 totals 36,892,864 tons, an increase of 10,582,925 over the figure for 1922.

Ore Imports Increase

Philadelphia, Sept. 4.—Imports of iron and iron ores into this port for the week ended Sept. 1, again showed a large total. Iron ore received amounted to 48,648 tons, 23,398 tons of which came from Sweden and 25,250 tons from Cuba. Other imports were 507 tons of British India pig iron, 4986 tons of English pig iron, and 15 tons of English scrap.

WarehouseBusinessShows Little Weakness

WAREHOUSE PRICES, PAGE 692

New York, Sept. 4.—Quotations in the local warehouse market continue relatively steady. Virtually the only weakness is in the lighter sizes of black sheets and the standard sizes of galvanized sheets. A substantial quantity of galvanized continues to be booked at 6.15c, although as low as 5.75c can be done. On the lighter sizes of black sheets, prices range around 4.90c. While demand for these descriptions is not active, the weakness appears due more to a substantial accumulation of supplies in some quarters. The bulk of the present movement is in shapes and bars, and considering trading as a whole, the month of August was as active as July.

Demand Slightly Heavier

Chicago, Sept. 4.—Demand for iron and steel products from Chicago warehouses has improved slightly during the past week according to reports. Prices hold firm with some indication of buying for small dealer stocks.

Business Continues Active

Detroit, Sept. 4.—No change in price levels was noted in the local warehouse market during the past week, although demand continued in fair volume.

Prices Remain Firm

Philadelphia, Sept. 4.—Jobbers report a continued active demand for iron and steel from stock, although the aggregate business of the week was cut down because of the holiday. Indications are for a continuation of existing good business. Prices remain unchanged and firm.

Furnaces To Be Repaired

Blast furnace reports for August revealed that several of the number of stacks which were blown out or banked during the month will undergo repairs. The No. 3 furnace of the Republic Iron & Steel Co., Haselton, O., is being relined and rebuilt; both stacks of the American Rolling Mill Co., Ashland, Ky., are being repaired, the slag track being repaired at No. 1 furnace. The Standish, N. Y., stack of the Chateaugay Ore & Iron Co. is to be repaired. The Dunbar, Pa., furnace of the American Manganese Mfg. Co., was out of blast on Aug. 31 while minor repairs were made but it was again active on Sept. 1.

Plate Volume Is Steady

Mills Not Catching Up on Shipments, as New Business Continues To Be Placed—Prices Holding Firm—Oil Tanks Pending

PLATE PRICES, PAGE 641

Philadelphia, Sept. 4.—Demand for plates in eastern territory which was dull all during August shows some improvement although bookings continue considerably below shipments. Hence order books are shrinking. It is now easy to get sheared plates in two to three weeks. Included in the orders placed the past week is 2000 tons for oil tanks. Considerable interest in manifested here in the inquiry of the Standard Oil Co. of New Jersey for 9000 tons of plates for tanks. The plate market continues. firm at 2.50c, Pittsburgh, or 2.82c, Philadelphia.

Buying Rate is Slackening

Pittsburgh, Sept. 4.—Inquiries for plates are apparently showing some slackening tendency. Conditions in the oil fields have again reversed themselves and more attention now is being paid to piping oil or packing it in cans for export than to storing it in tanks. Some tank inquiries still are current however, and a few that were out are indefinitely postponed. Some inquiries are current for barges but only around 5000 tons of plates are involved in this work and little or no car or locomotive business is pending. Notwithstanding these quieter conditions, the market remains strong on the basis of 2.50c, base Pittsburgh. The inauguration of the 8-hour work day is doubtless increasing costs but to what extent is not as yet known. So far the effect of these increased costs has been solely to stabilize the 2.50c base Pittsburgh figure. Plate mills are operating at around 80 to 85 per cent of capacity although some in the valley are understood to be needing business.

Tank Demand Declines

Chicago, Sept. 4.—Oil companies apparently have had their plate requirements satisfied during the last few weeks of active buying and at present no inquiry of importance is before mills in the Chicago district. Railroads still are the chief buyers but the tonnages have all been small and in most cases for repair purposes. The leading independent has opened its book for last quarter delivery at 2.60c, which meets the Steel Corporation price. Corporation shipments have exceeded new orders for several weeks and deliveries now are much better.

Inquiry Continues Good

New York, Sept, 4.—Inquiry for plates is generally good and from a wide variety of sources, though large lots are not plenty. One producer finds bookings come fairly close to production, though deliveries are becoming better as the backlog is cleared. Other makers find demand better than usual at this season. Deliveries can be obtained in two to four weeks. The inquiry of the Standard Oil Co., of New Jersey for 9000 tons of plates and 1000 tons of shapes has not been placed and the belief is held by many producers that this tonnage will not be bought. Its appearance has not had the effect of bringing out less than the prevailing price of 2.50c, Pittsburgh, which remains firm.

Large Mills Heavily Filled

Cleveland, Sept. 4.—Plates do not manifest the easier deliveries that have developed in steel bars and structural shapes. One of the largest makers says it will have difficulty in delivering its obligations before February. Miscellaneous business is well maintained. No action yet has been taken on the two ore vessels requiring 10,000 tons for the Ford Motor Co. upon which lake yards are figuring. An inquiry for 20 stills for a Standard Oil Co. subsidiary requiring 600 to 800 tons which has been up for several weeks still is unplaced. Prices are firm at 2.50c, Pittsburgh, and for early deliveries premiums still are being paid. Eastern makers are quoting 2.50c, for western delivery, representing $3 to $4 above 2.50c, Pittsburgh, and can make shipments in two to four weeks.

Attorneys General Oppose Pittsburgh Plus Prices

Chicago, Sept. 4.—A national association of steel consumers to oppose the practice of quoting "Pittsburgh Plus" on steel products is declared to be probable as a result of the action of the National Association of Attorneys General in going on record against this practice at its recent convention at Minneapolis.

The resolution adopted by the attorneys general on this occasion is as follows:

"Be it resolved by the National Association of Attorneys General at its 16th annual meeting, held Aug. 27 and 28, 1923 in Minneapolis, Minn., that this association emphatically and unreservedly goes on record against the steel trade practice commonly known as "Pittsburgh Plus" and that as an association and as individual attorneys general we pledge our support and co-operation in the fight being made before the federal trade commission for the abolition of that practice. It is unjust, uneconomic and works an unlawful discrimination that can be no longer tolerated."

Blast Furnace Explodes

Philadelphia, Sept. 4.—While being blown out for repairs last night, the blast furnace of the Pulaski Iron Co., Pulaski, Va., exploded, killing four men. Ten other workmen received minor injuries. Officials of the plant state that 60 days will be required before the blast can be resumed.

Concrete Buying Lighter

Activity Centers in Few Sections of Country as Dullness in Demand Continues—Price Shading Still in Evidence

REINFORCING BAR PRICES, PAGE 641

New York, Sept. 4.—While considerable tonnage of reinforcing bars is being bought in lots under 100 tons, larger projects are not being closed. After the unusual activity of earlier months of the year this condition is not unexpected. Sellers of these bars have large order books and are prepared to be continuously busy for some time on present commitments. Some shading is being done in bars from store, though sales probably average 2.75c, Pittsburgh store, as prices above that level are obtained occasionally for unusually prompt delivery. Mill prices remain at 2.40c, Pittsburgh, though this is not in active competition with warehouse sales.

Activity Increasingly Limited

Pittsburgh, Sept. 4.—Concrete bar activity is increasingly limited in this territory. The only award of note this past week was the 90 to 100-ton lot bought from the Truscon Steel Co. for the Cox garage building, Charleston, W. Va. Several inconsequential tonnages also were awarded for other jobs and the general quotation continues unchanged at 2.50c, base Pittsburgh. Inquiries only are fair, taking in but a few small lots in addition to those noted last week. The trade is much interested in the 100 to 150 tons required for the Junior high school at Ambridge, Pa.

Few Awards Being Made

Cleveland, Sept. 4.—Few awards of concrete reinforcing bars are being made, with but little tonnage being involved Considerable shading is being done to get business by some dealers in the city trying to unload stocks, but the going price is still 2.75c, Pittsburgh.

The 1400 tons required for the Baldwin reservior project has been let to The Youngstown Sheet & Tube Co. On new steel bars 2.40c, base Pittsburgh, is quoted as the general market while 2.30c and 2.25c, mill, is quoted on rerolled bars.

Sales Again Improve

Chicago, Sept. 4.—After a decline in activity a week ago, sales of concrete bars have again improved and the tonnage placed during the past week is probably in excess of that of any week since July. Three important apartment projects in California were left for concrete construction and the total amount of bars represented is in excess of 700 tons. Other awards include 600 tons for a department store at St. Paul. 200 tons for the sanitary district at Evanston, Ill., and a long list of smaller jobs. The price holds firm at 3.00c Chicago warehouse.

CONCRETE CONTRACTS PLACED

Awards this week ..... 8,085 tons
Awards last week ..... 9,198 tonc
Awards two weeks ago ..... 2,952 tons

1400 tons, work at filtration plant of Baldwin reservoir, Cleveland, to Youngstown Sheet & Tube Co.
1280 tons, Elks club building, San Francisco, to Golden Gate Iron Works.
1000 tons, second unit of Dexter Horton building, Seattle, Wash., to Puget Sound Bridge & Dredging Co.
800 tons, club house for Milwaukee Lodge of Elks, to Corrugated Bar Co.
750 tons, Chicago sanitary district to independent fabricator. General contract to Griffith Co., Chicago.
500 tons, wharf at Mare Island Navy Yard, to Columbia Steel Co.
300 tons, 13-story apartment building on Catalina street, Los Angeles, to independent fabricator.
300 tons, Kresge building, Cincinnati, to L. Schreiber & Sons Co.
200 tons, sanitary district of Evanston, Ill., to Concrete Steel Co.
200 tons, Graystone apartment building, Hollywood, Cal., to independent fabricator.
200 tons, apartment building on East Ocean avenue, Long Beach, Cal., details withheld.
175 tons, addition to Oneida street power plant, Milwaukee Electric Railway & Light Co., Milwaukee, to Wisconsin Bridge & Iron Co.
170 tons, Board of Public Works, Los Angeles, to Truscon Steel Co.
140 tons, girders for the Fair store, Chicago, to Hansoll-Elcock & Co.
120 tons, Hale Bros. Co. addition, Fifth and Sevenson streets, San Francisco, to W. S. Wetenhall & Co.
120 tons, buildings for San Rafael Gas Co., San Rafael, Cal., to Western Iron Works.
115 tons, Chinese theater, Grant avenue and Pacific street, San Francisco, to Ralston Iron Works.
115 tons, addition, Union Storage Co., Erie, Pa., to Ferro Construction Co.
100 tons, Cox garage building, Charleston, W. Va., to the Truscon Steel Co.
100 tons, addition to Hotel Retlaw, Fond du Lac, Wis., to Corrugated Bar Co.

CONCRETE CONTRACTS PENDING

550 tons, warehouse at Ninth and Brannan streets, San Francisco; bids in.
190 tons, warehouse for Western Pacific railroad, Mahony Bros. general contractors. Steel not yet placed.
250 tons, foundry building for Great Western Smelting & Refining Co., San Francisco; bids in.
100 tons, office building at University and Shattuck avenues, Berkeley, Cal.; bids asked.
150 tons, Ambridge, Pa., junior high school; bids being taken.

Municipal Work

Continues to Demand Large Tonnages of Cast Iron Pipe

PIPE PRICES, PAGES 641 AND 696

Chicago, Sept. 4.—While the general run of small orders for cast iron pipe continues at about the same rate, much expected heavy tonnage for fall construction has failed to materialize and both inquiry and sales are now reported slightly less than was the case a week ago. Bids were opened Saturday for 200 tons of 10-inch pipe for Pittsfield, Ill., and the city of Chicago will open bids tomorrow on 800 tons of various small sizes. Prices are nominally unchanged but some manufacturers are known to have shaded the schedule on the small sizes. No report has been issued of the 2700 tons wanted for the Chicago sanitary district.

5000-Ton Contract Awarded

New York, Sept. 4.—Contract for 5000 tons of 20 and 30-inch pipe for the city water department has been awarded to John Fox & Co. This business was placed by the Kelly Co., general contractor. New bids on the general contract for installing 700 tons of pipe for the water department will probably be asked. The Cotter Contracting Co. was low bidder at the opening a couple of weeks ago. Sentiment continues strong, with the leading makers sold well ahead. On some of the larger sizes of pipe it is difficult to obtain delivery much before Dec. 1. Prices are tending upward, now holding at around $68.60, New York, on 4-inch and $63.60 on 6-inch and over.

Pressure for Deliveries Great

Pittsburgh, Sept. 4.—Pressure for pipe deliveries continues heavy, particulary from jobbers. Interest in oil country goods continues keen from the West, South and Southwest, although from other sections such as Pennsylvania and West Virginia it is not so marked. Orders and specifications usually are for assorted amounts, 10,000 to 25,000 feet of a size at a time. No new line pipe business is up for consideration and no large lots are reported closed this week. Pipe plant operation continues in the neighborhood of 80 to 90 per cent of capacity on the average.

New Business is Regular

Birmingham, Ala., Sept. 4.—New business in cast iron pipe market is coming in regularly. Specifications are in sight in California for early letting of 4200 tons of pipe. Sanitary pipe making will be renewed this week by the Birmingham Machine & Foundry Co., after several weeks shutdown. The United States Cast Iron Pipe & Foundry Co. and the National Cast Iron Pipe Co. are making pipe under the DeLavaud method in this district, the National company recently adding machines to its plant at Tarrant city.

Soil line pipe prices have been advanced $5 a ton.

25-Mile Order Placed

Cleveland, Sept. 4.—An order for 25 miles of 10-inch steel line pipe requiring about 2000 tons has been distributed by the Ashtabula Gas Co. The business was split up among several mills. Demand for merchant pipe is reported by the mills to be continuing at a very heavy rate. Jobbers especially are endeavoring to increase their supplies by ordering from several mills at the same time.

Heavy Tonnage Pending

San Francisco, Sept. 1.—Only 700 tons of municipal cast iron pipe awards were placed this week, the largest involving 527 tons for Santa Barbara. Over 4000 tons is pending and it is thought that this lot will be closed within the next few days. The latest inquiry involves 1000 tons for Glendale, Cal. Little improvement is noted in demand for pipe coming from private sources. Prices remain unchanged from those of last week.

CAST IRON PIPE PLACED

5000 tons, department of water, gas and electricity, New York, to John Fox & Co., through the Kelly Co.
323 tons, work for Seattle, Wash., to American Cast Iron Pipe Co.
527 tons, 6, 8 and 12-inch Class "B" pipe for Santa Barbara, Cal., to United States Cast

Iron Pipe & Foundry Co.
188 tons, 4 and 6-inch pipe for Sacramento, Cal., to United States Cast Iron Pipe & Foundry Co.

CAST IRON PIPE PENDING

1011 tons, 4 to 16-inch pipe for Lewiston, Idaho; bids in.
1000 tons, 4, 6 and 8-inch Class "B" pipe for Glendale, Cal.; bids in.
600 tons, 4 and 6-inch pipe for Oak Lodge water district, Oak Lodge, Oreg.; Parker & Schram, low bidders.
200 tons, 10-inch for Pittsfield, Ill.; bids in.
800 tons, small sizes for city of Chicago; bids in.

$5.50 Price

On Tin Plate Will Apply To Fourth Quarter Business

TIN PLATE PRICES, PAGE 641

Pittsburgh, Sept. 6.—The American Sheet & Tin Plate Co., today announced that its price for tin plate for the fourth quarter is reaffirmed at $5.50 per base box, 100 pounds, Pittsburgh.

Pittsburgh, Sept. 4.—With the opening of its books, scheduled to take place this week, the American Sheet & Tin Plate Co. faces the fourth quarter with only about seven weeks' production of that period for sale. All of October and most of November's output already is obligated in its carry-over; hence it will finish the year without fully discharging its obligations and without furnishing all the tin plate business presented to it by its regular customers. Some of the independents too are well obligated into the fourth quarter without having settled upon a price, but the general expectation is that the $5.50 per base box of 100 pounds, Pittsburgh, figure will continue to prevail. Because the filled-up state of the tin plate producers is generally well known, there is not much circulation of inquiries in the open market. Tin plate consumers generally recognize that efforts to locate tonnages for prompt shipment are futile. Stock lists are limited and production plate, as indicated, is well obligated. An oil interest is understood to have closed with a West Virginia independent on a fair sized tonnage and from time to time other consumers endeavor to increase their receipts by placing orders in addition to their contracts, having underestimated their full year's requirements. Tin plate mill operation is somewhat better than in sheets, the general average being somewhere between 85 and 90 per cent. So much attention has been paid to food containers during recent weeks that much oil can and miscellaneous can business has been held in check.

Large Order Placed

New York, Sept. 4.—The inquiry of the Texas Co. for 75,000 base boxes of tin plate has been placed, going, it is understood, to a producer with mills on the Ohio river. Fourth quarter prices have not been announced and sales for that delivery are being made at prices to be determined later. Announcement of prices for the final quarter is expected shortly and it is believed they will be the same as for third quarter, $5.50, Pittsburgh, though many makers believe a higher figure is justified. Most makers are well sold to the end of the year.

Sheet Prices Reaffirmed

Leading Interest Announces Quotations for Fourth Quarter at Present Levels—Has Large Carryover—More Interest in Market

SHEET PRICES, PAGE 641

Pittsburgh, Sept. 6.—(By wire)—The American Sheet & Tin Plate Co. today announced prices for the fourth quarter reaffirming all of its third quarter levels on sheets. Blue annealed sheets are quoted at 3.00c; black at 3.85c, galvanized at 5.00c and cold finished automobile sheets 5.35c, all base Pittsburgh.

Pittsburgh, Sept. 4.—Sometime during the present week the American Sheet & Tin Plate Co. will announce prices for the fourth quarter. Because it has such a large carry-over, however, it will be necessary again to allot tonnages to regular customers. It has less than two months' production of the last quarter to sell. It is possible there will be no change in price. Pressure still is as heavy as ever upon it for tonnage of all kinds, and on certain grades it is heavier than for several weeks past. Full-finished sheets for new models being put out by various automobile companies are in keen dlemand. Agricultural implement interests are actively specifying and requesting immediate shipment on blue annealed, galvanized and black sheets. The jobber trade wants everything from terne plate to common one-pass black sheets. Jobbers everywhere are seeking to replenish their stocks quickly. Hot mills still are short of skilled men, rollers, heaters, doublers, etc., and this is limiting production to an average of 80 to 85 per cent of capacity. Many of the independent mills are anxious to obtain black sheet business but there does not seem to be enough to go around: hence, some mills are offering concessions of about $2 per ton to obtain tonnage backlogs. This makes a price of 3.75c, base Pittsburgh, against the regular 3.85c market level. Blue annealed is firm at 3.00c as is galvanized at 5.00c. Full-finished automobile sheets are unchanged at 5.35c, base Pittsburgh.

Orders Far Below Shipments

Philadelphia, Sept. 4.—Sheet demand here during August was the dullest in some time. Present specifications and orders appear to be 50 to 60 per cent of shipments, hence bookings continue to recede. However, the feeling is cheerful and expectations prevail that improvement soon will manifest itself. Prices are unchanged. Blue annealed is firm at 3.00c, Pittsburgh, equivalent to 3.32c, Philadelphia. Galvanized is firm at 5.00c, Pittsburgh. Black sheets continue easy at 3.75c, Pittsburgh. Consumers generally continue specifying on 3.85c contracts.

The anthracite coal strike has resulted in a complete curtailment of buying on the part of coal operators. Some are cancelling orders recently placed.

Fall Demand Heavy

Chicago, Sept. 4.—Sheet steel bookings for fourth quarter have been unusually heavy during the past week, and a large proportion of the mill capacity in this district now is taken for the remainder of the year. The leading independent company holds firm to its established prices despite some lower quotations in the market. It reports fourth quarter capacity practically all booked. Demand is from a widely scattered list of consumers, prominent among which are heater and stove manufacturers and pressed metal plants of various kinds. The automobile demand for sheets has improved during the week.

Prices Firm, Shading Stops

New York, Sept, 4.—Sheet demand keeps up well and shading in black sheets, formerly apparent in this market, is not now noticed. The market holds at 3.00c Pittsburgh for blue annealed, 3.85c for black and 5.00c Pittsburgh, for galvanized. Some sellers find inquiry is increasing and they are making no progress in catching up on delivery. Buyers are asking for prompt and fourth quarter tonnage. Sales for the latter delivery are at prices to be announced later. It is believed quotations for the remainder of the year will be a continuation of third quarter prices. Users are taking their entire contract tonnages. Jobbers are taking large tonnages to fill their assortments.

Order Mail Is Heavier

Youngstown, Sept. 4.—The heaviest mail in any morning in months is reported by all sheet makers in valley today some of it being the result of a natural banking up of orders in the two-day holiday but more especially it is due to a growing volume of new sheet business. Considerable tonnage of black sheets are being booked for fourth quarter delivery at prices to be named later and also for full-finished auto-body sheets. Auto builders now are swinging into full production of new models and are laying growing volume of new material specifications before sheet makers. All this is adding to the pressure upon the mills to name fourth quarter prices but local mills are waiting to see what the American Sheet & Tin Plate Co. will do. Independents here looks for the leading producer to name present quotations all through the sheet and tin plate schedule.

Sheet and tin plate mills are operating as last week at about 75 or 80 per cent of capacity. Although some have enough business on books to warrant a higher rate of operations, they cannot find crews to man additional mills.

The suit of the Allied Chemical & Dye Corp. filed in circuit court against the Steel & Tube Co. of America has been transferred to the federal court on petition of the latter company. No date has been set for hearing. The suit attempts to set aside the terms of sale of Steel & Tube properties to the Youngstown Sheet & Tube Co.

Shape Buying Strong

Despite Holiday Aggregate Tonnage for Week Shows Increasing Activity—Prices Are Firmer Under Heavier Demand

STRUCTURAL SHAPE PRICES, PAGE 641

New York, Sept. 4.—Activity in the local structural market again gained last week. Prices continue strong. Despite a general slowing up of business due to the holiday Sept. 3, several substantial tonnages were placed with a good volume of new inquiry being brought out. Outstanding in the inquiry is that of a commerical building in the Pennsylvania terminal zone involving from 5000 to 6000 tons. Prospects are considered excellent for a good month. Some interests expect no price advance but believe that the market will continue strong at 2.50c, base Pittsburgh. Fabricated prices after following an easier tendency during the past month, are again headed upward.

Awards Decrease Slightly

Chicago, Sept. 4.—The structural market holds up along encouraging lines, despite the fact that total bookings during the past week are reported lower than for the week previous. The Golden Gate Iron Works secured 1280 tons for a club house in San Francisco. The Fair store, Chicago, let 140 tons for alterations and 750 tons have been placed for the Chicago Sanitary district. The leading independent has recently opened its books for the fourth quarter delivery at 2.60c, Pittsburgh.

Pending Tonnages Small

Pittsburgh, Sept. 4.—As compared with the large structural shape jobs being awarded in other sections of the country during the past few weeks, jobs let in the Pittsburgh territory comprise relatively small lots. However, the Jones & Laughlin Steel Corp. was warded the contract for the Fairfax Telephone building, Northside, Pittsburgh, 300 tons. About 600 tons is involved in the American Sintering Co.'s new plant at Hubbard, O. The H. K. Ferguson Co., Cleveland, is understood to have the general contract. Between 300 and 500 tons are involved in the junior high school at Ambridge, Pa., which is expected to go to the American Bridge Co. No concessions under the 2.50c open market figure on structural shapes can be discovered and to all appearances the market is firmer on that basis than before the inauguration of the shorter workday in the iron and steel mills. Further details are being worked out in connection with several local projects, including the Smithfield street church building, the building for the A. W. Smith Co. at Sixth and Smithfield streets, and the Rosenbaum Co. warehouse.

New Business Confined

Boston, Sept. 4.—New business in the structural market in New England is confined to small orders. The price of shapes holds at 2.50c. Pittsburgh base, with the undercutting by independents at a 2.40c level still continuing. The latter are doing only a minor business. Stone & Webster recently placed a contract for between 450 and 500 tons of steel, for fabrication only, with one of the large producers. This is to be used in construction of the power plant of the Edison Company of Boston, at Weymouth, Mass. The only inquiry in the market at present is one for 200 tons for an apartment house.

Bookings Still Below Shipments

Philadelphia, Sept. 4.—Plain shape business here during the past week reflected some shinkage, apparently due to the holdiday, although on a whole, bookings were below shipments. The usual price of 2.50c, base Pittsburgh, or 2.82c, Philadelphia, is well maintained. An occasional sale is made at 2.40c, Pittsburgh. Structural fabricating shops in this district continue active, with some having sufficient business for capacity operations throughout the remainder of the year. A number of new structural jobs are coming out, the largest being a building for the Insurance Co. of North America, requiring 5000 tons. Several other good sized jobs are contemplated.

Deliveries Are Easier

Cleveland, Sept. 4.—With but a limited tonnage of new shape business being booked in this district, mills are now able to quote anywhere from six to eight weeks on deliveries, with 60 days being the average. No awards of size were made during the week. Inquiry is well maintained in aggregate tonnage although each job calls for a small lot. The 1750 tons of plain material for a building for the Standard Oil Co. of Ohio here, placed sometime ago with the Massillon Bridge & Structural Co. for fabrication, was let to two mills during the week. Small angles are difficult to get. The mill price of 2.50c, base Pittsburgh, holds firm.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 9,690 tons
Building awards last week .....48,154 tons
Building awards two weeks ago ..15,163 tons

3000 tons, plates and shapes, tank for Milwaukee Gas Light Co., Milwaukee, to Riter-Conley Co.
2000 tons, boiler house at Weymouth, Mass., to Shoemaker Bridge Co.
1200 tons, Sonn apartment, New York, to Hay Foundry & Iron Works.
1050 tons, Friedenberg loft building, West Forty-seventh street, New York, to Hay Foundry & Iron Works.
900 tons, retort house, Isabel Porter Co., Buffalo, to Bethlehem Steel Corp.
650 tons, bank at Greensburg, Pa., to Harris Structural Steel Co.
640 tons, transit shed, New York, to Levering & Garrigues.
500 tons, building for Edison Electric Co., Boston, to Jones & Laughlin Steel Corp.
400 tons, seven steel highway bridges, state of Washington, to Wallace Equipment Co.
350 tons, bridge work for Louisville & Nashville railroad, to Mt. Vernon Bridge Co.
300 tons, Fairfax Telephone building, Northside, Pittsburgh, to Jones & Laughlin Steel Corp.
300 tons, second unit, Dexter Horton building, Seattle, Wash., to Puget Sound Bridge & Dredging Co.
250 tons, hydroelectric plant, Oak Grove, Oreg., to Puget Sound Iron & Steel Works.
250 tons, hydroelectric plant, Ford Motor Co., St. Paul, Minn., to Pittsburgh Bridge & Iron Works.
250 tons, bridge for Seaboard Air Line, to Virginia Bridge & Iron Co.
200 tons, turntables for Chesapeake & Ohio railroad, to Bethlehem Steel Co.
150 tons, 100-foot riveted steel span bridge, state of Washington, to Puget Sound Iron & Steel Works.
150 tons, Washington high school, Portland, Oreg., to Wallace Equipment Co.
150 tons, single bridges for Long Island railroad, New York, to Harris Structural Steel Co.

STRUCTURAL CONTRACTS PENDING

5000 to 6000 tons, commercial building, Pennsylvania terminal zone, New York; pending.
3000 tons, girls school, Brooklyn, N. Y.; George A. Fuller, low on general contract.
1500 tons, two loft buildings for Bricken Construction Co., one each at 226 West Thirty-seventh street and 248 West Thirty-eighth street, New York; pending.
1100 tons, office building, *Jersey City Journal*, Jersey City, N. J.; pending.
1100 tons, bridgework for Louisville & Nashville railroad; bids being taken.
1000 tons, loft building, West Thirty-ninth street, New York; bids asked.
600 tons, plant at Hubbard, O., for the American Sintering Co.; general contract awarded the H. K. Ferguson Co., Cleveland.
550 tons, stable for Sheffield Farms, Bronx, N. Y.; pending.
500 tons, junior high school, Ambridge, Pa.; American Bridge Co. reported low bidder.
250 tons, Glenn Falls Portland Cement Co., Glenn Falls, N. Y.; pending.
180 tons, sand storage building, for Cadillac Motor Car Co., Detroit; Austin Co., Cleveland, general contractor.
175 tons, trunk highway plate girder span at Pestigot, Wis.; bids in Sept. 13.
150 tons, machine shop for Pennsylvania railroad, Olean, N. J.; bids asked.

Farmers Help Plants To Install 8-Hour Day

Pittsburgh, Sept. 4.—Steelmaking continues on approximately the same basis as for the past two or three weeks despite the growing inauguration of the shorter workday. The Carnegie Steel Co. continues to operate 92 per cent of steelmaking capacity. The general average is around 90 per cent. The Carneige company has 44 blast furnaces making pig iron and 3 making ferromanganese and spiegeleisen. The demand for pig iron is not sufficiently large or well sustained and production has been further curtailed. In addition to the Allen S. Davidson Co. stack banked Aug. 20 and Midland No. 3 of the Pittsburgh Crucible Steel Co. which banked Aug. 9, the Struthers Furnace Co. has banked its stack at Struthers, O., and the McKeefrey Iron Co. at Leetonia, O. may be blown out or banked this week. The Dover, O. stack of M. A. Hanna & Co. is out and the A. M. Byers Co. is talking of relining its stack of Girard, O.

Blast furnaces and particularly those of the Carnegie company which have been turned over to an 8-hour day, report smooth operations under the three-shift basis. The shortage of labor continues to exist but this has been relieved somewhat through the fact that farmers in surrounding territory are leaving their farms to work the 8-hour shift at the blast furnaces from 3 to 11 p. m.

Valley Furnace and Mill Operations Unchanged

Youngstown, Sept. 4.—Labor day was observed by all steel plants except those of the Carnegie Steel Co. Independents

maintained continuous operations only. There is little change in the schedules of operations for the balance of the week. Blast furnaces are unchanged, 32 of the 46 stacks in the Youngstown district being in operation. Steelmaking also is unchanged. Forty-four of the 51 independents' open-hearth furnaces, 30 corporation's open hearths, and all four bessemer plants are in operation.

No change is noticed in sheet mill operations which embrace 79 of the 117 mills in the Mahoning valley. The active mills are divided as follows: Youngstown Sheet & Tube Co., 20; Newton Steel Co., 17; Trumbull Steel Co., 15; Republic Iron & Steel Co., eight; Sharon Steel Hoop Co., seven; Mahoning Valley Steel Co., six and Falcon Steel Co., six.

Other finishing mill operations are unchanged, with bar, plate and tube mills at full capacity. All of the corporation's tin mills and all but six of the independent tin mills are scheduled.

Steel Corporation To Aid Japanese Relief

New York, Sept. 4.—Judge E. H. Gary, chairman of the United States Steel Corp., today gave expression to the profound sympathy of American industry over the Japanese catastrophe. He pointed to the close business relationship existing between the two countries and was confident that banks and great corporations throughout the country would subscribe liberally to relief.

The committee of which Judge Gary is a member sent telegrams to members of the Japanese society appealing for contributions.

Judge Gary stated that the finance committee of the Steel corporation would meet Sept. 5 to consider the contribution of the corporation. This is in accordance with the corporation's policy on previous similar occasions. It is understood that at the time of the San Francisco disaster the corporation contributed $115,000 and from $25,000 to $50,000 at the time of the Sicilian earthquakes.

One out of the three of the corporation's vessels in Japanese waters went ashore in Yokohama, according to Judge Gary, but while badly damaged was not destroyed, so far as can be learned. The corporation has 50 boats on the seas and has lost but one man. It has two representatives in Tokio but has not been able to get into communication with them.

Appoints Sales Agents

Youngstown, Sept. 4.—The Youngstown Sheet & Tube Co. announced several additional changes in sales personnel, Sept. 4. William H. Bruce has been made sales agent at New Orleans and B. T. Becthel sales manager for the Chicago district. Mr. Bruce was formerly southern agent for the Steel & Tube Co. of America while Mr. Becthel was formerly general manager of sales for that company and previous to that was sales manager for the Mark Mfg. Co., Pittsburgh.

Roads Still Seek Steel

Requirements for 1924 Rails Continues To Be Center of Interest—Track Fastening Buying Steady—Car Orders Scattered

RAILROAD TRACK MATERIAL PRICES, PAGE 641

Chicago, Sept. 4.—The feature of the iron and steel market in the West continues to be the demand for 1924 standard rails. At the present time one of the western roads is inquiring for 30,000 tons and other inquiry brings the total before mills close to 50,000 tons. Actual bookings in new sales during the past week for 1924 delivery have been in excess of 80,000 tons. Railroad car buying continues quiet, the only item of importance being the purchase of 1000 box cars by the Canadian National railway from the Western Steel Car & Foundry Co.

Bookings of track fastenings, spikes bolts, joints and angle bars have shown some improvement and the total tonnage is favorable.

Car Demand Improved

New York, Sept. 4.—Demand for cars is somewhat improved. Little in the way of outstanding inquiries is noted, but lists are more numerous. Included is a fair amount of repair work. Locomotive buying includes one locomotive for the Pacific Lumber Co., two for the Sul Miniera Rede de Viacao, Brazil, and two for the Caminhos de Ferro de Louirenco Marques, Portuguese, East Africa, all going to the Baldwin Locomotive Works. Included in current inquiry is a locomotive for the Lake Champlain & Moriah. The Tennessee Coal, Iron & Railroad Co. has booked 30,000 tons of standard steel rails for 1924 delivery for the Louisville & Nashville railroad.

To Start Work on Cutoff

Seattle, Wash.—Work on the 118-mile cutoff of the Central Pacific railway, from Oakridge to Kirk, in Oregon, will be started about Jan. 1. The estimated cost of the extension is $16,000,000.

Soon to Release Orders

Philadelphia, Sept. 4.—The Pennsylvania railroad has cancelled a number of odds and ends of old order books, but this involves only a comparatively small tonnage. This road, which held up specifications on a number of finished material contracts three weeks ago, now expects to begin to release orders within the next couple of weeks.

Price Well Maintained

Pittsburgh, Sept. 4.—Despite the fact that competition from rerollers continues keen with prices from $5 to $7 per ton below their own figures, makers of light rails from billets are maintaining the 2.25c, base Pittsburgh, figure which has prevailed. Tonnage business still is absent, the only orders noted being for relatively small amounts, a carload or two at a time. Coal mine activity as yet shows no signs of opening up and the buying of light rails is only being done for the active sections.

Track accessory demand continues fairly strong although it is not now of sizable proportions. Orders are small but as long as they are sufficiently numerous makers are satisfied to have it that way. Makers still are behind on shipments; in some cases as much as three months. Tie plates are unchanged at 2.60c; standard spikes at 3.15c; small spikes at 3.50c; and track bolts at 4.00c to 5.00c. No large tonnage inquiries for any of these commodities now are up for consideration from the railroads.

CAR ORDERS PLACED

Canadian National railway, 1000 box cars, to Western Steel Car & Foundry Co.
Union Pacific, 200 tank cars, to Standard Tank Car Co.
Minnesota Steel Co., 20 flat cars, to Standard Steel Car Co.
Swift & Co., 100 steel refrigerator car underframes, to Bettendorf Co.
Bradford Oil Refining Co., five tank cars, to General American Tank Car Corp.
New York Central, 500 hopper car bodies, to Merchants Despatch Transportation Co.
Jonesboro, Lake City & Eastern, rebuilding 100 box cars, to own shops.
Chicago & Alton railroad, 300 gondolas, 200 flat cars, to unnamed builder.
Jersey Central railroad, 300 box car repairs, 100 to Magor Car Corp., 200 to American Car & Foundry Co.
Delaware & Lackawanna, 200 refrigerators; purchase abandoned.
Philadelphia & Reading railroad, 600 car repairs, 400 at Middletown and 200 by Pressed Steel Car Co.

CAR ORDERS PENDING

Chesapeake & Ohio, repairs to 500 coal cars; bids asked.
Baltimore & Ohio, repairs to 200 coke cars; bids asked.
New York Central, 100 automatic dump cars; bids asked.
Mitsui & Co., New York, 60 box cars; pending.
Union of South Africa, 50 narrow gage coaches; pending.

Car Loadings Again Set New High Record

Washington, Sept. 4.—Loadings of freight cars for the week ended Aug 25, totaling 1,069,932, again set a high water mark in the history of freight transportation in this country. This record is 34,191 cars above the previous high loading. Of the total for the week of Aug. 25, 203,076 cars were loaded with coal, 13,513 with coke and 77,918 with ore. Due to the heavy demand for light loadings of freight and short hauls, from Jan. 1, to Aug. 15, new freight cars in service totaled 103,374. On Aug. 15, the railroads had on order 80,535 new freight cars.

Change to Eight Hours

Anderson, Ind., Sept. 5.—Twenty-five men were added to the American Steel & Wire Co.'s force here Monday when the galvanizing department went on the 8-hour shift. This department was the only one working 12-hour shifts. The others are working 8-hour shifts.

The Diamond Alloy Tool Co., Toledo, O., was incorporated several weeks ago to take over the business formerly in the hands of the Kent-Owens Machine Co.

The Nonferrous Metals

Prices Decline in Copper and Zinc but Lead and Tin Stay Strong While Two Former Metals Make Later Recovery

	Copper—Electro delivered	Copper—Lake delivered	Spot Straits New York	Lead† New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
Aug. 29.....	13.87½	14.12½	40.75	6.92½	6.42½	25.50	7.50	29.00
Aug. 30.....	13.62½	14.00	40.87½	6.95	6.42½	25.25	7.50	29.00
Aug. 31.....	13.62½	14.00	40.62½	6.95	6.42	25.25	7.50	29.00
Sept. 3—Holiday								
Sept. 4.....	13.75	14.00	41.62½	7.00	6.45	25.25	7.50	29.00

†Outside market quotation.

NEW YORK, Sept. 4.—Further declines in copper featured the nonferrous metal markets the past week. Electrolytic copper sold down to 13.62½c delivered at the close of last week, as against 14c quoted at the beginning of the week.

Anxiety over the continued unsettled condition of the important European market, combined with a high rate of production attained earlier in the year to meet a peak domestic consumption and good foreign demand, have caused the pressure on the market. Consumers have been holding off all through the industry, pending prospects of a stable price. Fabricated copper and brass prices have not been reduced since Aug. 23, but the reductions made at that time have not stimulated buying. Casting and lake copper and scrap prices have also declined in sympathy with electrolytic, which is the basic grade. Today the copper market was a little firmer. The Japanese catastrophe may affect metals.

Zinc was slightly easier, but with no great pressure from sellers, as a good foreign and domestic business has been done in August and production has been curtailed by labor troubles. In consequence prices ranged from 6.40c to 6.45c, East St. Louis, practically all week. Today the market was stronger at 6.50c. Brass special sold at 12½ to 15 points over prime western. High grade zinc has been selling at 8c to 8.50c, delivered. Sheet zinc base price has been firm at 9.25c, f.o.b. mill.

The lead market has been extremely strong, due to a heavy buying movement by both consumers in the East and Middle West, also to the curtailment in supplies the past month or two. The American Smelting & Refining Co.'s advance to 6.75c, New York, on Aug. 27, was followed by further advances in the outside market, with sales at 6.65c East St. Louis and at 6.90c to 7c, New York.

Tin has been strong with a good volume of business done for account of tin plate makers for fourth quarter deliveries. From March to July tin plate makers held out of the market and the price of Straits tin dropped from 50c to 37.50c; in recent weeks the leading interest has been a large buyer and subsequently independent mills also have been in the market. In consequence the world market has recovered substantially and the New York price has advanced from 40c to nearly 42c.

Aluminum has been soft, due to resale offerings for account of consumers who overbought or who have desired to take profits on contract metal, rather than melt it. Ninety-eight to 99 per cent virgin ingot aluminum has been offered in the outside market at 25c, delivered, as against 26.50c, delivered, quoted some weeks ago.

Antimony has been quiet and easy, with spot available at 7.50c, duty paid, New York, and futures offering at 5.50c, c.i.f., New York, in bond. Dealers who bought on the bullish speculative movement a few weeks ago have been trying to take profits.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 4 oz., min.	22.50
High brass	18.50
Zinc, ga. 9 to 18 (plates ½c less)	9.25
Lead, full sheets (cut ¼c more)	10.25
Aluminum, base 18 ga. and up...	**35.40**
SEAMLESS TUBES	
High brass	24.00
Copper	25.50
RODS	
High brass, round, ⅝ to 2½-inch	16.75
Naval brass rod	19.50
WIRE	
Copper	16.50 to 17.00
High brass	19.00

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	9.00 to 9.50
New York	9.00 to 9.25
Chicago	9.50
HEAVY YELLOW BRASS	
New York	6.25 to 6.50
Chicago	7.50
Cleveland	6.00 to 6.50
ZINC	
New York	4.25
Cleveland	3.00 to 3.25
HEAVY COPPER AND WIRE	
Cleveland	11.00 to 11.50
New York	11.25 to 11.75
Chicago	11.50
RED BRASS TURNINGS	
New York	8.00 to 8.25
Cleveland	8.50 to 9.00
Chicago	8.00
YELLOW BRASS TUBING	
Cleveland	5.50 to 6.00
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.00 to 6.50
New York	6.75 to 7.00
Chicago	7.50
ALUMINUM BORINGS	
Cleveland	8.00 to 9.00

The foundry and machine shops of the Oldsmar Mfg. Co., Oldsmar, Fla., have been taken over by the Oldsmar Automotive Accessory Corp., a new company formed recently, and an investment of several thousand dollars is being made in converting the plant for the manufacture of automobile accessories and parts, and replacement parts for tractors.

Americans Remodel and Equip Citroen Plant

Detroit, Sept. 4.—Remodeling and expansion of the automobile plants of Andre Citroen, France, will be undertaken by American engineers and all equipment installed will be American made. Henry M. Lane, president of the H. M. Lane Co., industrial engineers, left this week for Paris, where he will take charge of the large expansion program of the Citroen company. Others in the Lane organization will go to France to assist Mr. Lane. They will be absent two years.

Before leaving Mr. Lane contracted with the Young Bros. Co. for industrial ovens for the Citroen plants. Machinery, consisting of fine drill presses, boring machines and others to the value of $150,000 was purchased from Palmer-Bee Co. This equipment will be shipped before the first of 1924 to be ready for installation as fast as the factory units are constructed.

Mr. Lane said the Citroen output is about 250 cars daily, but this will be more than doubled within a year, or as business requires it. Mr. Citroen made a tour of study of American automobile plants last year.

Coal Strike May Cut Down Car Supply

Washington, Sept. 4.—Government officials continue to believe that the anthracite strike will not spread to the bituminous coal regions, but they are somewhat apprehensive that a protracted strike will cut heavily into the freight car supply. In the eight days ended with Aug. 22 the railroads had a daily average net surplus of 67,227 serviceable freight cars. The heaviest loading period of the year is only four to six weeks distant now, and if the anthracite strike is not settled shortly, open-top equipment will be called into play to transport bituminous coal to the anthracite-consuming districts of the East. The longer haul would appreciably reduce car efficiency and directly affect the movement of bituminous coal.

At this time the anthracite situation affects domestic consumers almost wholly. If the strike is prolonged it will, of course, react upon the bituminous coal situation. Bituminous consumers are well fixed for stocks, as the Aug. 1 statement of the geological survey and the federal fuel distributor shows. By-product coke users on Aug. 1 had on hand stocks sufficient to operate 27 days, while steel plants had a 35-day supply. For all consumers the 51,000,000 tons of bituminous coal in storage on Aug. 1 would last 44 days. Since Sept. 1, 1922, bituminous coal stocks have been increased 29,000,000 tons. The railroads on Aug. 1 had a 39-day supply in their stockpiles.

Iron Imported from India

First Shipment Since Beginning of War Arrives at San Francisco —Independents Reaffirm Sheet Prices—Trade Good

SAN FRANCISCO, Sept. 1.—Interest this week in the local market for iron and steel products has been centered around the announcement by a number of the independent companies, of fourth quarter prices on sheets. Demand for most lines remain good, though not as heavy as is the case in wire products and tubular goods.

Practically all manufacturers and sellers in this district are a unit in declaring that August sales will show a considerable improvement over those for July, and that the outlook for the remainder of the year, is decidedly encouraging.

Building activity is being well maintained up and down the coast. Los Angeles reports that permits issued up to and including Aug. 21 numbered 4072 and totaled $15,611,267 as compared with 3329 permits and a valuation of $10,723,486 for the corresponding period last month.

Further reports have been received this week that some steamship companies operating in the intercoastal trade and supposed to be members of the new conference, have taken contracts at the old 30-cent rate, which leads the trade generally to believe that the new 40-cent rate will not long remain in effect.

Pig Iron and Coke

Buying of pig iron is limited and as far as can be ascertained no large lots have moved during the past week. The only inquiry of any size before the trade involves 1000 tons for a Los Angeles interest. Recently several hundred tons of No. 1 Indian iron, running 2.75 to 3.25 in silicon, has been brought in. This is the first arrival of Indian iron in this port since before the war. Formerly this material was well liked by consumers and the movement was heavy and it is thought that it will again become a factor in this section. Prices remain about the same, $33 a ton c.i.f. duty paid San Francisco being quoted on large lots and from $34 to $36 on the smaller lots. Little of interest has occurred in the coke market and sales have been confined to small and scattered lots.

Bars, Plates and Shapes

While there are a number of projects pending which will require fair sized lots of reinforcing bars few awards involving large lots were made this week. The total was less than 1000 tons, the largest lot involving 500 tons for a wharf at Mare Island which went to the Columbia Steel Co. Bar mill operators state that a satisfactory volume of business is coming to hand. Movement of merchant bar material continues to be confined to relatively small lots and little or no improvement in demand for this material is noted. Prices continue firm at 3.25c f.o.b. San Francisco for merchant bars and 3.50c f.o.b. San Francisco for concrete bars. Consumers have recently been quoted 2.60c c.i.f. duty paid San Francisco on foreign bars, but as far as known no orders have been placed.

Plate movement of late has been confined almost entirely to lots for oil storage tanks but some fair sized awards have been made involving, in the aggregate, a considerable tonnage. The outstanding award of the week involved 3600 tons for twelve 80,000-barrel tanks for the Associated Oil Co. divided evenly between the Western Pipe & Steel Co. and the Steel Tank & Pipe Co. In addition, the latter firm recently secured three 80,000-barrel tanks, involving 900 tons, for the Wilshire Oil Co., one 80,000-barrel tank, involving 300 tons and two 55,000-barrel tanks, involving 400 tons, for C. C. Julian, three 80,000-barrel tanks involving 900 tons for the Associated Oil Co. and two 55,000-barrel tanks, involving 400 tons for the Mohawk Oil Co. Bids were opened on Aug. 27 by San Diego for a steel standpipe involving 400 tons and the Pittsburgh-Des Moines Steel Co. were low. Prices this week have eased off and 3.00c to 3.10c c.i.f. San Francisco is considered the general run. In one instance a lot of several hundred tons was secured well under the 3.00c figure.

New tank inquiries this week include 10 to 12 80,000-barrel tanks for the Pan American Petroleum Co. at Los Angeles and involve approximately 3600 tons of material.

A number of the independent sheet producers have opened their books, in this territory, for fourth quarter naming 3.00c, 3.85c and 5.00c base Pittsburgh for blue annealed, black and galvanized sheets respectively. The leading interest has made no announcement relative to its policy. Demand is limited and as far as known consumers and distributors have not yet placed any fourth quarter contracts.

Northwest Outlook Good

SEATTLE, Sept. 1.—No outstanding features are shown in the iron and steel trade in this territory. Business shows an improved ton and general optimism prevails as to the prospects for fall. For some time orders have been in small tonnages although several sizable contracts are to be awarded soon.

Wholesalers as a rule are well stocked, having purchased heavily during the last 60 days. Announcement of higher water freights on Aug. 1 stimulated considerable buying. Practically all cargo moved under the old rates has arrived. Although the intercoastal lines have announced that the new tariffs, which increased steel from 30 to 40 cents. per 100 pounds will remain in effect until the end of the year, competition for business is so keen that reports are current that some of the lines have agreed to keep old tariffs in effect in the meantime. Other lines are reported to be willing to cut the new rates. The situation is not stabilized and is being closely followed by steel shippers.

Bars, Plates and Shapes

While jobbers report a fairly good demand for these items, other wholesale interests state that demand is spasmodic. Plates and structurals have been quiet but the outlook is better. Merchant bars are moving in fairly good volume. Prices are somewhat unsteady although local jobbers have not recently revised their quotations. Due to a local fight between rival interests at Portland, it is understood that there has been considerable price cutting on bars. This has unsettled the situation and Seattle wholesalers are considering action to offset the conditions at Portland. The local mill has not changed its prices on bars.

Pig Iron and Coke

This market shows no change from a week ago. The indications are more favorable. Importers do not anticipate much buying on the part of consumers until late in the year as foundries and shops are either supplied for their immediate needs or are purchasing only from hand-to-mouth. The best grades of Glangarnock is being sold here at $36. The coke situation is unchanged and featureless.

Other Finished Materials

Jobbers report an excellent month's business, August showing an improvement over July and equaling the record of August last year which was the best month of 1922. Sheets, rivets, spikes, pipe, tubing and practically everything is moving in satisfactory volume. Repair material is in especially good demand. Lumbering and logging companies are buying freely and building hardware is also in strong demand. Sheets show a much better tone, the demand having increased materially during the last half of the month. Price lists are unchanged.

Old Materials

Dealers report conditions unchanged. Demand is at a minimum and prices are correspondingly weak. The volume of business is exceedingly small and no immediate improvement is apparent. Steel scrap is selling in small tonnages at $10 and less while cast iron scrap is listless at $20 to $22. There is no export inquiry from Japan even at the present low prices of steel scrap. A few lots of scrap are moving to Kobe and other Japanese ports but these are old contracts.

Engineer M. M. Caldwell, Seattle, is planning three steel bridges costing $700,000 to be erected in Southwestern Washington, two at Aberdeen and one at Hoquiam.

August Pig Iron Drops Sharply

With 3,442,614 Gross Tons, Production Continues on Decline and Is the Lowest since February—Blowing Out or Banking of 26 More Stacks Reduces Active Total to 273 on Last Day of Month

WITH a sharp drop in August, production of coke and anthracite pig iron has continued on the down grade. The decline was not surprising, however, since the August output was obliged to reflect the loss of the 23 furnaces which were blown out in July and 26 additional furnaces were blown out or banked in August. The decline in daily production was the largest of any month since the peak was passed in May.

The output of 3,442,614 tons in August was a loss of 242,063 tons from the 3,684,677 tons made during the preceding month. This was about 425,000 tons short of the high point production of May. On an average daily basis, the August output was 111,052 tons per day, which compared with the 118,860 tons of July, was a drop of 7808 tons per day. This was the lowest rate since February when the rate was 106,925 tons per day. On Aug. 31 the number of active furnaces was 273 as compared with 299 on July 31.

MONTHLY PRODUCTION

	1923	1922	1921
January	3,228,226	1,645,804	2,414,753
February	2,993,918	1,630,180	1,929,394
March	3,523,595	2,035,908	1,594,866
April	3,546,308	2,070,161	1,190,751
May	3,868,486	2,309,348	1,215,272
June	3,667,868	2,362,455	1,064,007
Total 1st half.	20,828,401	12,053,856	9,409,043
July	3,684,677	2,403,030	864,642
August	3,442,614	1,810,665	954,901
September		2,024,008	985,795
October		2,629,655	1,234,450
November		2,846,110	1,414,958
December		3,083,520	1,642,775
Total 2nd half		14,796,988	7,097,521
Grand total..	27,955,692	26,850,844	16,506,564

AVERAGE DAILY PRODUCTION

	1923	1922	1921	1920	1919
Jan.	104,136	53,090	77,895	97,172	106,654
Feb.	106,925	58,220	68,906	102,904	105,120
March	113,664	65,674	51,447	108,895	99,614
April	118,210	69,005	39,691	91,754	82,479
May	124,790	74,495	39,202	96,510	67,991
June	122,262	78,748	35,466	101,533	70,467
July	118,860	77,517	27,892	98,190	78,200
Aug.	111,052	58,408	30,802	101,468	88,453
Sept.	.....	67,466	32,859	104,143	82,692
Oct	.....	84,827	39,821	106,075	60,142
Nov.	.....	94,870	47,165	97,836	80,244
Dec.	.....	99,468	52,992	87,105	84,711
Ave.	115,044	73,563	45,223	99,456	83,910

The output of merchant iron in August was 805,637 tons and a loss of 94,859 tons from the 900,496 tons produced in July. Reduced to a daily basis this represented 25,988 tons per day, or 3060 tons per day less than the 29,048-ton rate of the preceding month. Nonmerchant or steelmaking iron in August totaled 2,636,977 tons which represented an decrease of 147,204 tons from the 2,784,181 tons made the month before. On a daily basis this averaged 85,064 tons as against 89,812 tons per day in July, a drop of 4748 tons.

Furnaces active on the last day of the month totaled 273, as against 299 on July 31, a loss of 26 stacks. During July 23 furnaces were blown out or banked. Thus 49 furnaces have become inactive during the last two months. Active furnaces on the last day of August were the smallest since Jan. 31 when 261 were operating. Two merchant furnaces were blown in during August and 12 blown out with a loss of 10 for this class. Two nonmerchant furnaces were blown in and 18 blown out or banked with a net loss of 16. Of the total number of furnaces blowing on the last day of the month, 87 were merchant and 186 nonmerchant. The corresponding figures for July were 97 and 202 respectively. On Aug. 31 the Steel corporation was operating 105 furnaces as compared with 106 on July 31 and 114 on June 30.

Among the stacks blown in during the month were: In Ohio: River No. 4, McKinney Steel Co. In Pennsylvania: Shenango No. 3, Shenango Furnace Co., one New Castle, Carnegie Steel Co. In Tennessee: Clarksville, J. J. Gray, Jr.

Stacks blown out during August were: In Ohio: Haselton No. 3, Republic Iron & Steel Co.; River No. 1, McKinney Steel Co.; Belfont, Belfont Iron Works Co.; Lucy, Carnegie Steel Co.; Jisco, Jackson Iron & Steel Co.; Anna, Struthers Furnace Co; Buckeye, American Rolling Mill Co. and Hubbard Nos. 1 and 2, Youngstown Sheet & Tube Co. In Pennsylvania: Brooke, E. & G. Brooke Iron Co.; Carbon, Carbon Furnace Co.; Clinton, Clinton Iron & Steel Co.; Sharpsville, Allen S. Davison Co.; one Palmerton, New Jersey Zinc Co.; Midland No. 3, Pittsburgh Crucible Steel Co.; one Bethlehem, one Steelton, two Cambria, one Coatesville and North Cornwall G, Bethlehem Steel Co. In New York: Standish, Chateaugay Ore & Iron Co. and Harriet Y, Wickwire-Spencer Steel Corp. In West Virginia: Top, Wheeling Steel Corp. In Alabama: Alabama City, Gulf States Steel Co.; City No. 2 and Sheffield, Sloss-Sheffield Steel & Iron Co. In Kentucky: Ashland No. 1 and No. 2, American Rolling Mill Co. In Illinois: Joliet No. 2, Illinois Steel Co.

DIVISIONS OF PRODUCTION

1922	Merchant	Non-merchant	Spiegel	Ferromanganese	Other ferro
Jan.	388,322	1,257,482	1,230	5,644	825
Feb.	355,455	1,274,725	4,930	3,618	872
March	390,643	1,645,265	2,095	11,604	1,102
April	375,814	1,694,347	4,211	14,998	828
May	410,404	1,898,944	4,902	15,432	405
June	423,672	1,938,783	4,817	18,254	854
July	441,752	1,961,278	7,176	18,873	1,887
Aug.	343,522	1,467,143	7,925	11,402	976
Sept.	353,604	1,670,404	4,235	10,681	934
Oct.	502,231	2,127,424	12,285	9,193	1,080
Nov.	603,348	2,242,762	4,192	13,232	961
Dec.	668,950	2,414,570	10,591	17,108	989
Total	5,257,717	21,593,127	68,589	150,039	11,713
1923					
Jan.	713,186	2,515,040	12,056	19,358	952
Feb.	708,901	2,285,017	3,657	21,410	759
March	767,219	2,756,376	13,832	20,730	236
April	795,558	2,750,750	7,440	20,810	670
May	909,726	2,958,760	9,533	19,568	892
June	899,102	2,768,766	18,184	19,717	874
July	900,496	2,784,181	12,876	26,493	776
Aug.	805,637	2,636,977	5,586	21,806	1,800

AUGUST PIG IRON

	No. of stacks	No. in blast day of month Aug.	July	Total tonnage made Merchant	Nonmerchant	Totals August	July
Pennsylvania	150	105	116	199,168	1,045,418	1,244,586	1,354,803
Ohio	79	53	60	160,148	620,251	780,399	832,737
Alabama	42	24	27	132,370	98,301	230,671	238,005
Virginia	19	6	6	27,848	.....	27,848	29,167
New York	27	22	24	106,160	137,187	243,347	261,785
New Jersey	4	2	2	19,449	.....	19,449	19,381
Illinois	26	21	22	72,687	284,132	356,819	372,329
Colorado	5	1	1				
Indiana	16	16	16	29,551	314,406	343,957	362,731
Maryland	6	5	5				
Wisconsin	6	3	3				
Kentucky	7	0	2				
West Virginia	5	3	4	15,943	62,964	78,907	81,174
Tennessee	14	5	4				
Washington	1	0	0				
Georgia	2	0	0				
Texas	1	0	0				
Minnesota	3	3	3	30,179	57,260	87,439	92,420
Michigan	4	4	4				
Missouri	1	0	0				
Spiegel and ferro—all states	...	...	...	12,134	17,058	29,192	40,145
Totals	418	273	299	805,637	2,636,977	3,442,614	3,684,677

Italian Crisis Is Not a Factor

European Business Unaffected as Yet by New War Clouds—British Pig Iron and Steel Prices Continue To Weaken—Good Orders Placed for Battleship Forgings—Ruhr Coke Deliveries Increase

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Sept. 4.—The Italian crisis has not as yet effected the European business situation. In Great Britain three more blast furnaces have been banked and the output generally now is being absorbed, although prices are weaker. Coke supplies are easier and foundries are re-entering the market. The steel trade continues to suffer from the boilermakers' lockout. Galvanized sheet and tin plate mills are filling up until the end of the year. Steel prices are easier and many firms are declining to make further reductions, preferring to stop operation. Continental competition is largely ineffective except on joists which are selling for £8 15s ($39.72). Sheffield interests have taken good orders for heavy forgings for battleships.

The French position in regard to coke supplies has improved and 150,000 tons of Ruhr coke monthly to the end of the year now are assured. Coke ovens have been taken over and operated by French foremen. More ovens have been repaired and will restart soon. Coke supplies in general, however, still are insufficient. The French steel mills have two months' supply of orders on hand. Several French and Belgian mills have withdrawn from the market and prices show a tendency to rise. The Forges de La Province have taken 10,000 tons of rails and splice bars for Argentina. An acute labor shortage is handicapping production.

New German prices this week are as follows: Pig iron, 177,000,000 marks; billets, 296,000,000 marks; coke, 105,000,000 marks; sheet bars, rods, rails and shapes, 350,000,000 marks; plates, 400,000,000 marks; bars, 512,000,000 marks; medium plates 450,000,000 marks; sheets, 539,000,000 marks; bands and wire 478,000,000. German works outside of the Ruhr are busy.

The price changes in the British market noted in the week bring the following products to the levels as quoted:

Sheet bars and billets £7 2s 6d ($32.35); steel bars for home £9 ($40.86); steel bars for export £8 10s ($38.59); English ship plates for home £9 ($40.86); English ship plates for export £8 12s 6d ($39.16); Scotch plates for home £9 ($40.86); Scotch plates for export £8 15s ($39.73); Middlesbrough No. 3 foundry iron £4 18s ($22.25); Derbyshire No. 3 foundry iron £4 12s 6d ($21); Northamtonshire No. 3 foundry iron £4 10s ($20.43) and Staffordshire No. 3 foundry iron £4 12s 6d ($21).

Sterling exchange is figured on a basis of $4.54.

British Makers Offering Price Concessions

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

BIRMINGHAM, England, Aug. 22.—Iron and steel trades continue to build their hopes on an autumn revival, and makers are doing their best to encourage this by price concessions. European political complications still are the chief concern, and it is concluded from the latest interchange of notes that a settlement is remote. The stacks of iron and steel in the Ruhr recently seized by French and Belgians, are estimated at 500,000 to 700,000 tons, consisting of scrap, pig iron, steel, sheet material and some ore. Approximately 200,000 tons represents finished material. It is assumed that the liberation of this large quantity would have a disturbing effect on the market, and might involve a slump in prices.

No further curtailment of furnace production has been reported. Approximately 30,000 tons of pig iron is the amount of stock in makers' yards, the bulk being in Cleveland. This is not a large total, and experience has shown that any considerable buying movement would quickly absorb it. Barrow-in-Furness by its drastic reduction to 12 operating furnaces has put an end for the time being to further stock increases, and there is a hopeful feeling that some additional furnaces may soon be called for. Most of the iron made there, apart from that locally consumed, is going to Midland users, neither the Continent, Scotland nor South Wales being large buyers.

Sterling—$4.55

In Cleveland 41 furnaces are at work of the 114 available, and 11 are producing ordinary iron, 12 hematite and 18 various other descriptions. The nominal figure for No. 3 keeps at £5 2s 6d ($23.31), but sales have been made as low as £5 ($22.75). Hematite appears to be rather firmer, but still can be bought at £4 18s ($22.30). Exports are so small that the August totals must compare unfavorably with those of recent months. In the Midlands the consumers are at last taking an interest in their future requirements, and some sales were made at the weekly meeting held in Birmingham yesterday. Derbyshire No. 3 foundry can be bought at £4 12s 6d ($21.04), Northampton at £4 10s ($20.47) and forge iron, which after a long interval is once more being sought by Staffordshire ironmasters, is selling at £4 9s ($20.24) delivered. One transaction is said to have taken place at £4 7s ($19.79).

There are signs that an influential section of the steel trade considers the time has arrived to call a halt to the price-cutting policy. Important Sheffield and Rotherham firms have declared they will make no further reductions, preferring to close down. The same spirit is being manifested in regard to semifinished steel. Leading Welsh firms are accepting £7 15s ($35.26). Some of the largest Midland firms de-

Current Iron and Steel Prices of Europe

Last Reported Prices Converted into Dollars at Rates of Exchange, September 3

British Market

Corrected to Date by Cable
Home Market Prices. Gross Tons at Works or Furnace

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	32.35	7 2 6
Sheet bars	32.35	7 2 6
Wire rods	49.37	10 17 6
FINISHED STEEL		
Steel bars, England, ⅝ to 3-inch	40.86	9 0 0
Steel bars, England, ⅝ to 3-inch, for export	38.59	8 10 0
Plates, ship, bridge and tank, England	40.86	9 0 0
Plates, ship, bridge and tank, England, for export	39.16	8 12 6
Plates, ship, bridge and tank, Scotland	40.86	9 0 0
Plates, ship, bridge and tank, Scotland, for export	39.73	8 15 0
Beams, England	40.86	9 0 0
Beams, England, for export	38.59	8 10 0
Beams, Scotland	40.86	9 0 0
Beams, Scotland, for export	38.59	8 10 0
Sheets, black, 24 gage	56.75	12 10 0
Sheets, black, 24 gage, for export	54.48	12 0 0
Sheets, galvanized, 24 gage	83.99	18 10 0
Rails, 60 pounds and over	38.59	8 10 0
Rails, 60 pounds and over, for export	36.32	8 0 0
Tin plate, base box, 108 pounds	5.22	1 3 0
Steel hoops	52.21	11 10 0
Steel hoops, for export	49.94	11 0 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	22.25	4 18 0
Hematite, West Coast, Mixed Numbers	22.25	4 18 0
Basic, Middlesbrough	22.70	5 0 0
No. 3 Foundry, Middlesbrough	22.25	4 18 0
No. 3 Foundry, Derby, Leicester, Nottingham	21.00	4 12 6
No. 3 Foundry, Northamptonshire	20.43	4 10 0
No. 3 Foundry, Staffordshire	21.00	4 12 6
No. 3 Foundry, Scotch	23.04	5 1 6
Ferromanganese, 76 to 80 per cent	81.72	18 0 0
Ferromanganese, 76 to 80 per cent, for export	83.99	18 10 0
COKE		
Yorkshire furnace	5.90	1 6 0
Yorkshire furnace, for export	10.22	2 5 0
Yorkshire foundry	7.95	1 15 0
Yorkshire foundry, for export	11.35	2 10 0
Where no separate export prices are given, apply to domestic and foreign business.	same	quotations

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	—*	177,000,000†
Foundry, No. 3, Oberhausen	—	177,000,000†
Bessemer Stahleisen, Siegen	—	177,000,000†
Foundry, No. 1, Oberhausen	—	177,000,000†
Luxemburg Foundry	—	177,000,000†
COKE		
Ruhr furnace	—	105,000,000
Ruhr foundry	—	105,000,000
SEMIFINISHED STEEL		
Billets	—	296,000,000
Sheet bars	—	350,000,000
Wire rods	—	350,000,000
FINISHED STEEL		
Standard rails	—	350,000,000
Merchant bars	—	512,000,000
Structural shapes	—	350,000,000
Ship plates	—	400,000,000
Medium plates, 3 to 5 millimeters	—	450,000,000
Sheets, below 3 millimeters	—	539,000,000
Tin plate		nominal
Plain wire	—	478,000,000
Bands and strips	—	478,000,000

All prices are f.o.b. furnace or mill.
*Dollar equivalents are misleading owing to the terrific depreciation of the mark at present.
†With German coke; where foreign coke is used quotations are higher.
On account of the occupation of the Ruhr these prices are largely nominal and cover domestic business only. Export prices are usually quoted, where deliveries can be made, in foreign currency according to the country of destination.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	25.84	455
Basic bessemer, Lorraine	23.00	405
Foundry, Longwy, No. 3, sand-cast	22.46	395
Foundry, Longwy, No. 3, chill-cast	23.00	405
Ferromanganese, 76 to 80 per cent	85.20	1,500
COKE		
French furnace	7.67	135
German furnace, f.o.b. frontier*	10.51	185
German furnace, f.o.b. frontier**	14.20	250
French foundry	8.24	145
SEMIFINISHED STEEL		
Blooms	29.54	520
Billets	32.94	580
Sheet bars	34.08	600
FINISHED STEEL		
Standard rails	34.08	600
Merchant bars	35.22	620
Angles	34.08	600
Normal beams and profiles	34.08	600
Plates, ship and tank, 10 millimeters and thicker	37.49	660
Plates, bridge and tank, 5 to 10 millimeters	38.06	670
Sheets, black, 3 millimeters	40.33	710
Sheets, blue annealed, 2 millimeters	47.14	830
Shafting, cold-drawn, 40 to 60 millimeters	71.00	1,250
Bars, 2 per cent nickel steel	116.44	2,050

All prices are f.o.b. furnace or works.
*Up to 50 per cent of normal requirements.
**Over 50 per cent of normal requirements.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	21.11	450
Basic open-hearth, Belgian	22.98	490
Gray forge, Belgian	12.66	270
Foundry, No. 3, Belgian	22.04	470
Foundry, No. 3, Luxemburg	22.04	470
Foundry, No. 3, Lorraine	22.04	470
SEMIFINISHED STEEL		
Blooms	27.67	590
Billets	29.78	635
Sheets bars	30.72	655
Wire rods	44.56	950
FINISHED STEEL		
Standard rails	32.83	700
Merchant bars	35.64	760
Normal beams and profiles	35.41	755
Plates, 5 millimeters and thicker	37.52	800
Sheets, black, 3 millimeters	40.80	870
Sheets, galvanized, 1 millimeter	91.46	1,950
Plain wire	56.28	1,200
Galvanized wire	68.01	1,450
Wire nails	58.63	1,250

All prices are f.o.b. furnace or works.

cline to do business below £8 ($36.40) and one works refused an attractive order, from the point of view of tonnage, at £17 15s ($35.26).

Recent reductions coinciding with a firmer continental market have checked foreign competition. At Birmingham the Belgian quotation for billets is £7 10s ($32.12) delivered. This price is not attractive, coupled with cash terms and slower deliveries. A quotation received in Birmingham offers the following minimum prices f.o.b. Antwerp. Wire rods, soft £10 15s ($48.91), soft steel billets £6 14s ($30.48) hard steel £7 ($31.85) sheet bars £6 18s ($31.39).

The tin plate trade shows encouraging signs of expansion, with larger orders coming from South America, the Far East and the colonies. In a published interview, an official of Baldwins Ltd., is quoted as saying that America is not likely to be much of a competitor with the Welsh manufacturers who have matters practically in their own hands. It is hinted, by this authority that money has been delayed by the stabilization scheme by means of which prices have been maintained at a minimum of £1 3s 1½d ($5.26) per box.

Belgians Forced to Cut Price of Iron

European Staff Special

BRUSSELS, Aug. 24.—The iron and steel industry of Belgium is experiencing considerable difficulty in adjusting itself to meet the shifting forces which have disturbed business generally throughout western Europe. Belgium, in proportion to her size, is the largest producer of manufactured products in the world, and therefore is more sensitive to outside influences than other countries. She is dependent upon foreign sources of supply for large quantities of raw material, and in turn must sell a large

Franc—$0.04525

part of her manufactured products in foreign markets. With the political sky clouded with reparations troubles, added to financial problems which have arisen since Belgian exchange has fallen to new low levels, it has become almost impossible to see any distance ahead.

Recent advances in pig iron prices could not be maintained in the face of keen competition from Lorraine furnaces. Belgian furnaces are again offering foundry pig at 480 francs ($20.40) to 500 francs ($21.25) f.o.b. Antwerp. The volume of sales, however, is limited as neither producers nor consumers care to commit themselves ahead in view of present market conditions.

There is a satisfactory demand for semifinished steel products for export at present exchange levels. England is buying regularly in Belgium. Basic bessemer ingots are quoted at 555 francs ($23.60). This price, however, is only nominal as the market is unstable and quotations from different sources disclose a wide range of prices.

Belgian finishing mills have things much their own way. Some competition is encountered from Lorraine but it is negligible. Merchant bars average 770 francs ($32.70) for domestic consumption. One mill recently quoted £7 19s, f.o.b. Antwerp, on a mixed lot for export. Platemakers likewise have been favored by the drop in exchange. All the mills are busy and prices are firm with an upward tendency. Export prices, particularly, are fairly uniform of late, and ¼-inch plates are being done at £8 f.o.b. Antwerp.

Pipe prices have been advanced five points and are expected to go higher on account of the increased cost of skelp. Makers of nails and other wire products are extremely busy and although they are obliged to buy rods in France at a comparatively high price, this is compensated by selling the finished products for export in sterling exchange. The Usines de la Providence at Marchienne au Pont in co-operation with the Luxemburg mill of De Wendel have secured an order from the state of Bolivia for 15,000 tons of rails.

Iron and steel workers have been granted a wage increase of 5 per cent, effective August 15.

German Prices Near World Markets

European Special Service

DUSSELDORF, Germany, Aug. 24.—The sudden rebound in the mark from 8,000,000 to 4,000,000 for one dollar has caused as much confusion in the iron and steel markets as the recent rapid fall. Coincidentally with the improvement in the value of the mark, furnace coke was increased in price to 33,980,000 marks per ton, equivalent to $8.50. The base price for foundry pig iron is 26,220,000 marks. As previously reported, this price is subject to a surcharge based on 50 per cent of the depreciation in the mark under 200,000 for one Dutch florin. This brings pig iron for current delivery up to 100,230,000 marks ($25) a ton. This price is more in line with world conditions than any which have prevailed in Germany recently. Likewise billets have been advanced under the sliding scale to 140,250,000 ($35) a ton, with shapes, bars and plates 179,000,000 to 202,000,000 marks per ton, equivalent to 2.04c to 2.27c per pound.

A common laborer is now paid 600,000 marks (15 cents) per hour. The labor situation is exceedingly unstable and strikes for higher wages are the rule

One Million Marks —$0.25

in occupied and unoccupied territory. Miners are on strike in Recklinghausen, Dortmund and other districts demanding a bonus of 50,000,000 marks ($12.50) to meet the cost of living. Although the riots at Crefeld and Aix-la-Chappelle have been quelled, the situation is still exceedingly unstable.

The French are continuing their policy of seizing English coal from plants which have refused to pay the coal tax to the allied authorities, but up to date only about 20,000 tons have been taken. The seizures of iron and steel by the French authorities now amount to around 500,000 tons, of which about 200,000 tons is finished steel.

Railroad freight rates will be increased 2000 per cent on Aug. 20. After Sept. 1 railroad rates will fluctuate automatically according to the gold value of the mark.

Coal miners in the Ruhr district have declined an increase in wages of 210 per cent, claiming that they are not sufficient to meet the cost of living. The result has been widespread strikes against the employers in contrast to previous strikes, which have been against the occupation. Some of the miners are demanding 25,000,000 marks ($6.25) a day. The enormity of these demands will be indicated when it is remembered that recently the wages of Ruhr miners on a gold basis have been as low as 50 cents a day. The producers are not meeting these demands, claiming that German wages on a gold basis are already 30 per cent higher than in Holland. This turmoil is the natural result of encouraging the workmen to strike against the French, at the same time paying them for doing nothing. The situation is acute in Dortmund, Essen and Gelsenkirchen and is compromising the passive resistance program. The owners feel they can take a strong stand because the production of coal is so limited in those sections.

German mills in unoccupied territory have bought heavy tonnages of wire rods recently but otherwise relatively little material is being imported except from Czecho-Slovakia and Austria.

Fall in Exchange Aids French Exports

European Staff Special

Office of IRON TRADE REVIEW,
23 Rue de la Bienfaisance

PARIS, Aug. 24.—The French iron and steel market is unusually firm for this season of the year. The recent fall in exchange and anticipated increases in the cost of coke are harbingers of higher prices for metallurgical products, and buyers feel that they cannot lose by covering at present levels.

During the first 13 days of August, France received 51,000 tons of coke from the Ruhr, or an average of 3900 tons per day. If shipments continue at this rate it will not be necessary to import any more coke from England or the United States. Due to the rising cost of Ruhr coke, the S. C. O. F. has announced its intention of advanc-

Franc—$0.055

ing the price for September. The exact figure has not as yet been decided upon, but it is rumored that the increase will be 10 francs ($0.55) per metric ton.

The demand for pig iron is brisk. The foundries are buying ahead as they fear that the upward adjustment of coke prices will be promptly followed by higher quotations for foundry pig. Producers, reasoning along the same lines, refuse to consider heavy commitments. Orders for chill-cast No. 3 foundry pig (2.50 to 3 silicon) for August and early September shipment are being booked at 400 francs ($22) per metric ton f.o.b. furnace. Sand-blast No. 3 (1.80 to 2.30 silicon) brings 10 francs ($0.55) less than the foregoing. Hematite prices vary in different districts. Calais furnaces quote 430 francs ($23.65); Outreau, 440 francs ($24.20); Lorraine, 450 francs ($24.75); Meurthe-et-Moselle, 465 francs ($25.60). In the Southwest one furnace is asking 475 francs ($26.10) on small lots for immediate shipment.

Spiegeleisen prices are taking another drop. Ferromanganese, 10 to 12 per cent, is quoted 585 francs ($32.15); 18 to 20 per cent, 685 francs ($37.67) and 78 to 80 per cent, is quoted as high as 1500 francs ($82.50).

Prices for finished steel products have been advanced more than in any other department. Merchant bars now are firm at 600 francs ($33) and many mills have gone beyond this figure.

Engineers Meet in Canadian City

After Tour of Mining and Manufacturing Centers of Dominion, Mining and Metallurgical Engineers Convene in Montreal—Devote Session To Discussion of Problems of Examination of Steel

AFTER a tour embracing the mining districts of Ontario and Quebec, beginning August 20, the members of the American Institute of Mining and Metallurgical Engineers held the technical sessions of the annual convention at the Mount Royal hotel, Montreal on August 30. About 150 were in attendance. The chair was occupied by John A. Dresser, president of the Canadian Institute of Mining and Metallurgy who, in his opening address, extended a cordial welcome to the visitors and announced that an honorary membership in the Czecho-Slovak Engineers and Architects association had been conferred upon Herbert Hoover, a past president of the institute. A program of papers and addresses covering a wide range of topics was presented for consideration.

In the iron and steel section the chair was occupied by J. V. W. Reynders. The discussion on the papers presented was mainly in the form of communications from engineers to whom the various papers had been submitted for criticism.

Discuss X-Ray Examination

An X-ray examination of steel castings was the subject of a paper by Dr. H. H. Lester, whose researches showed that it was possible to locate 1/10 inch flaws in steel 3 inches thick with a 30-minute exposure from commercial X-ray tubes, while correspondingly smaller defects can be likewise revealed in thinner sections. For thickness of metal near the limit of penetrability a flaw approximately 2 per cent of the thickness of the metal may be detected.

Dr. Angel St. John of Long Island City, N. Y., dealt with "X-Rays Examination of Irregular Metal Objects" describing a new method of mounting objects for X-ray examination by placing them in a liquid having nearly the same transparency as X-rays. Structural details can thus be seen in all parts of the most irregular objects. Typical defects observed in metals were illustrated. The method was characterized as rapid and inexpensive.

W. D. Cooledge, N. Y., stated that Dr. St. John had made a valuable contribution to the art of radiography. His company had developed an X-ray tube with a water cooler anode which operated satisfactorily at 50 milliamperes and 250,000 volts (crest value).

Dr. H. H. Lester in a paper dealing with Dr. St. John's method said that it estimated to a considerable extent the difficulty of distinguishing between surface marks and internal flaws. But it seemed to be limited to small, solid objects that could be inserted without inquiry in a solution that acts as an auxiliary absorber and the exposure would be controlled by the depth of the solution. In Watertown arsenal laboratory it was found that the sensitiveness of the X-ray method becomes less as the thickness of the material becomes greater and, therefore, it is to be expected that the detectability of a flaw would depend on the depth of the solution where the specimen is immersed in a fluid absorbing material.

C. Baldwin Sawyer, Cleveland, read a paper on "Nitrogen in Steel" showing that preliminary work on the determination of nitrogen in steel has increased the reliance placed on the distillation method, the results comparing favorably with those of a new combustion method. Using the distillation method, ingots of pure iron melted under various processes of nitrogen were examined for nitrogen content, which was found to vary as the square root of the pressure applied. Thin discs of sheet iron were nitrified in ammonia until they contained up to 4 per ent nitrogen. Re-treating these nitrified discs reduced their nitrogen content to an amount definitely related to the re-treating temperature.

A paper by James A. Aupperle of the American Rolling Mill Co., of Middletown, Ohio, stated that the embrittling effect of nitrogen was greater than that of phosphorous. The information that nitrified steel decomposes at high temperatures is of interest and Mr. Sawyer's paper showed that it should be possible to obtain uniform nitrified steel by treating steel in which the nitrogen is segregated. Investigations of the effect of nitrogen in steel from a corrosive standpoint, showed that steel contaning three times as much nitrogen as another sample would corrode three times as fast when exposed to atmospheric conditions. Investigation into the failures of other ferrous metals in the form of pipes and spikes, the former containing 0.041 per cent and the spikes 0.033 per cent nitrogen, showed both corroded very rapidly.

"Desulphurizing Power of Iron Blast Furnace Slags" was the subject of a paper by Prof. Richard S. McCaffery of University of Wisconsin and James F. Oesterle of Madison, Wis., giving the results of an investigation undertaken to determine the quality of different iron blast furnace slags as desulphurizing agents and the possibility of using in the blast furnace materials of higher sulphur content than is now usual. The results showed that the effect in blast furnace slags is to increase the solubility of the slags for calcium sulphide and is to diminish the solubilities of the slags for manganese sulphide. The effect of high temperature in increasing the solubilities of the slags was very marked. The chemical composition of the slag as affecting the solubilities of calcium and manganese sulphides is of less importance than the temperature of the slag. The region in which solution of calcium and manganese sulphides in the slag is most rapid is the hearth of the blast furnace.

Dr. A. Stansfield, Montreal, said that Canada has to study the effect of titanium in slag and the information contained in the paper would aid in the solution of the problem.

A. L. Field of Long Island City, N. Y., said he hoped the research would be continued. The work remaining to be done was concerned chiefly with the rates of difference and area of contact between metal and slag in the hearth.

H. A. Schwartz, H. R. Payne and A. F. Gorton were the authors of a paper on "The Effect of Silicon on Equilibrium Diagram of System Carbon-Iron near the Eutectoid Points" which was read by Mr. Schwartz.

Zirconium In Steel

The session concluded with the reading and discussion of a paper by Alexander L. Field, of New York on "Some Effect of Zirconium on Steel" which embodies the results obtained in the experimental manufacture and testing of sheets treated with zirconium. It was found that zirconium combines chemically with oxygen, nitrogen, and sulphur, and is able to neutralize the embrittling effect of phosphorus in whole or partly. A small addition of zirconium makes possible the satisfactory rolling of sheets containing as high as approximately 0.30 per cent sulphur. Plain carbon sheets

treated with approximately 0.15 per cent zirconium exhibit in the heat-treated condition tensile properties that closely approach those of alloy steels zirconium reduces the total oxygen content of steel and operates to prevent the occurrence of emulsified slag and "banded" structure. It combines with the nitrogen dissolved in molten steel to form a crystalline microconsistent of a bright lemon-yellow color which is in large part removed from the molten steel. Zirconium also forms with the sulphur content of steel an acid-insoluble sulphide and eliminates from high sulphur steels the last of iron sulphide.

I. C. Billiar, of the Standard Steel Works Co., Burnham, Pa., stated that some of these effects had been noticed in the manufacture of acid and open-hearth steels. There was considerable change in the color of the steel after zirconium had been added, the steel assuming a deep pink color. The recovery of zirconium ranged from 45 to 75 per cent averaging about 55 per cent. The average recovery of silicon in heats made with the addition of silicon zirconium was higher than the average recovery of heats made with the addition of titanium and 50 per cent of ferrosilicon which would seem to indicate the greater deoxydizing power of zirconium.

H. W. Gillett contended that endurance tests had not proved the benefits of zirconium in that respect but on other points a strong case had been made out. From the results of a long series of nickel-silicon steel tests, with and without zirconium, no beneficial effects could be traced to zirconium so that it would seem to be necessary that the value of the element should be proved.

On Thursday evening a banquet was held at the Mount Royal hotel, President E. P. Mathewson presiding. John A. Dresser, president of the Canadian Institute of Mining and Metallurgy, the first speaker, said that while Canada had immense undeveloped national resources, the Americans had a surplus of capital, neither of which was useful unless properly applied. What is needed is for American investors to come in and share the profits of development. The aim of the Canadian Institute of Mining and Metallurgy had been to present the opportunities which Canada offers.

Americans Warmly Welcomed Abroad

By Special Cable

LONDON, Sept. 3.—Negotiations instituted by Walter Wood of R. D. Wood & Co., Philadelphia, with the support of George H. Clamer, president of the American Foundrymen's association, may result in important changes in the methods of classifying British foundry pig irons for export. At the present time iron is sold largely by fracture with only a few furnaces selling according to the approximate chemical analysis. As a result of conferences with Sir Hugh Bell, owner of many Middlesbrough furnaces; Arthur Dorman, head of Dorman Long & Co.; and Sir William Larke, director of the National Federation of Iron and Steel Manufacturers, this organization is circularizing its members regarding the grading of export pig iron analysis with definite upper and lower limits of silicon and carbon and upper limits of sulphur and phosphorous with approximate penalties, premiums, etc., similar to the system now employed in the United States.

If these negotiations resulting from the visit of delegates of the American Foundrymen's association succeed, the entry of British irons into American markets will become easier.

Last week the American party toured Sheffield and Manchester, arriving at Birmingham Tuesday. The delegation was met at Sheffield by Thomas Firth, G. Ernest Wells, John Hyde, W. A. McDonald and J. Shaw, president of the Sheffield branch of the Institute of British Foundrymen. Members of the party visited the works of Hadfields Ltd. and the Edgar Allen foundries. On Wednesday luncheon was served at Hadfields at which time it was announced that P. B. Brown, managing director, had been elected a member of the Ancient Cutlers Company of Sheffield.

At a complimentary dinner given to the Americans Wednesday evening, at which Mr. Shaw presided, Sir Robert Hadfield proposed a toast to the American Foundrymen's association. He traced the development of the steel casting industry at Sheffield which prompted Mr. Clamer, in his response, to declare that Pittsburgh must look to its laurels. Dr. Richard Moldenke, Watchung, N. J., for many years secretary of the American Foundrymen's association, plead for co-operation in maintaining quality standards through agreement on international specifications. Thomas Firth, who made an extensive trip through the United States last year urged American foundrymen to induce American boys rather than foreigners to learn molding.

The climax of the English tour was reached Friday night at a dinner given by the National Founding Employers federation of which Oliver Stubbs is president. Mr. Stubbs, occupying the chair, warmly welcomed the Americans and read telegrams of greeting from Emil Ramas, president of the French Foundrymen's association, Mr. Leonard, president of the Belgian association, and from C. E. Hoyt, secretary of the American Foundrymen's association; John A. Penton, first secretary of the association and A. O. Backert, past president. He again urged the necessity of co-operation of business men in the interest of peace and prosperity. F. J. Taylor, J. Brown and G. Longbottom spoke for the National Iron Founders association, while President Clamer and Walter Wood responded on behalf of the Americans. Over 100 British manufacturers welcomed the delegation on its arrival at Manchester.

International Exhibition Opened at Paris

(By Special Cable)

Paris, Sept. 4.—The first international exhibition of the foundry industry to be held in France opened Sept. 2 at the Ecole National Arts et Metiers, Paris. G. Dufour, president of the Syndicate General Fondeurs de France, presided and was assisted by E. Ramas, president of the Association Technique Fonderie de France. M. Corre, director of the Ecole National Arts et Metiers, represented the minister of technical education, the minister of commerce, and other governmental officials.

President Dufour opened the meeting with an address in which he outlined the general progress made in the foundry industry in recent years. He also dwelt on the work of French foundrymen. M. Ramas spoke of the co-operation of other nations in the exhibition and conference to be held Sept. 12 to 15. The assembly sent greetings to the party of American foundrymen, now in England, who later will attend the Paris exhibition.

More than 70 exhibits of foundry machinery comprise the exposition. In a great many cases the equipment is displayed in actual operation. French, American and Belgian machines and castings are shown, while England and Italy are represented by attractive displays in which artistic castings are featur d.

IRON TRADE REVIEW

Registration Applied for

The Authority of Industry National and International

Published Every Thursday by

THE PENTON PUBLISHING CO., CLEVELAND, O.

Member, Audit Bureau of Circulation. Associated Business Papers, Inc., and National Publishers Association

BRANCH OFFICES

BOSTON - - - - - - - - - - - 426 Old South Bldg.
CHICAGO - - - - - - - - - - 1147 People's Gas Bldg.
CINCINNATI - - - - - - - - - - 514 Edwards Bldg.
NEW YORK - - - - - - - - 2203-2206 No. 220 Broadway
PITTSBURGH - - - - - - - - - 2148-49 Oliver Bldg.
SAN FRANCISCO - - - - - - - 675 Monadnock Bldg.
WASHINGTON - - - - - - - - - 84 Home Life Bldg.

FOREIGN OFFICES

BIRMINGHAM, ENG. - - - - - - - - Prince's Chambers
LONDON, ENG. - 2-3 Caxton House, Westminster, S. W. 1
PARIS, FRANCE - - - - - - 23 Rue de la Bienfaisance

Cable Address, IROTRAPEN, London, IROTRAPI, Paris

Subscription, United States, Cuba and Mexico, $6 per year. Canada, $8.50 per year. Great Britain and other countries, £2:0:0 per year

Entered at the Postoffice at Cleveland as Second Class Matter

Copyright 1923 by The Penton Publishing Co.

IN THIS ISSUE

September 6, 1923

PAGE

IRON AND STEEL MARKET REVIEW..... 637
IRON AND STEEL MARKETS.....638 to 651
IRON, STEEL AND SCRAP PRICES.....641, 692, 696, 700
FOREIGN MARKETS .....653 to 655
EDITORIALS 658, 659
BUSINESS TREND .....661 to 664
HEATING CAST ROLLS ELECTRICALLY..... 665
Electric Span Heaters Used in Warming Finishing Rolls of Sheet and Tin Mills—Practice Assists Production and Reduces Loss from Roll Breakage—Power Cost Is Reasonable
GERMAN INDUSTRIES IN COMBINE..... 669
MICROSCOPE AIDS STEEL SELECTION..... 673
CHINA A MARKET FOR STEEL SCRAP..... 678
MEN OF INDUSTRY..... 684
ISSUE NEW EXTRAS ON BAR IRON..... 685
NEW ERA FOR LABOR REACHED..... 687
TOOL DEMAND STILL IS RESTRICTED..... 688
CONSTRUCTION AND ENTERPRISE..... 690
NEW TRADE PUBLICATIONS..... 694

Coal Industry Again in Court

ONCE more the American public finds itself subjected to the cost and discomforts of a great coal strike and in the broader aspects, without just cause. After some weeks of argument and maneuvering in conference, thousands of men at the call of their leaders have forsaken their necessary and daily tasks in an attempt to enforce their demands upon an equally determined and obstinate set of employers. From the moment the miners laid down their tools, has begun to run a great bill in loss and damages that the public in the end must pay with added costs and inconveniences.

The strike in the anthracite regions is as indefensible and unwarranted as the bituminous struggle last year and the frequent suspensions of the past that have made the operation of the coal mines one of the most descriptive chapters of American industrial life and relationships. This does not mean grievances and perhaps valid ones do not exist on both sides. It does ignify, however, an absolute disregard for public right and interests and a lack of a conciliatory spirit toward intervention by state or higher authorities that puts self-thought above other consideration. It reflects arrogance as well as a lack of foresight and wisdom on the part of the leadership of both sides. These are the things which have caused the public to lose confidence in the sincerity and capacity of those directing the policies of both employer and employe, in the coal industry. Too often strikes have been the outgrowth of mere chickanery between the leaders and an attempt to gain temporary advantage on the part of either. The coal industry has been unfortunately and singularly lacking in that quality of leadership which has marked the successful conduct of other great industrial branches of the country.

Some day sooner or later, and it is hoped it may be sooner, the patience and forebearance of a long-suffering public with regard to the coal industry will have reached its limit. Then some drastic and effective reformation of the control and organization of the industry may be expected. The test of similar crises in the past has indicated an absence of requisite force and authority in existing laws or methods of regulation concerning employment disputes directly menacing the public welfare. This deficiency, whatever it is, is bound to be supplied with interest eventually and real honor created and put in some of the existing means for curbing unjustified interference with production by reason of labor disputes. The federal coal commission which has been at work in ascertaining the underlying facts clearly is laying the foundation whereupon effective legislation may be based. The strike in the anthracite fields is helping to crystallize public sentiment for quick and sure protective action. It is not too much to hope that the coming congress may do something with regard to the coal industry that will make such strikes as the present one both unpopular and unwise for those who are immediately responsible.

President Inspires Business Confidence

WHATEVER fears may beset industry and business as to the future of some of the uncertain world situations, there need be no doubt of the desire of the present administration at Washington to bestir an atmosphere of confidence and hope for the future. Those close to President Coolidge say it is his most ardent desire at this time that business may look to a more busy period of activity this autumn and winter, with the full assurance that it will be perfectly sound to make additional plans for the months to come.

The President considers confidence, stability and assurance for the future the greatest needs of business today. To this end, he has let it be known, he desires to submerge any comment for the time being on his probable candidacy for another term in 1924. One of his strongest wishes, callers at the White House have been told, is that business may strengthen its development unfettered by the chains of political indecision and vacillation. It is understood that he

wants business and industry to have a feeling of confidence in the stability of governmental things as they exist. This is one of the chief reasons for his constant reiteration that he would continue the policies of the late President Harding. Like his predecessor, Mr. Coolidge is said to hold to the view that things oftentimes will work themselves out to the best advantage by being allowed to develop unchecked by curbing influences.

Few if any changes in the personnel of the government are being considered now. It is the President's desire also to keep to the minimum the exercise of the flexible provisions of the Fordney-McCumber tariff act. When a sincerely active sentiment appears or the raising or lowering of any schedule, the administration will not be adverse to an adjustment. But it is the feeling of the President that the tariff be tampered with as little as possible.

In regard to taxation the attitude of the President runs in the same groove. Necessary revisions which become desirable from time to time will be favored by the President. But in the long run in all things the preference will be for continuance of the status quo rather than constant tinkering in quest of an elusive ideal. The President realizes that uncertainty is a greater hazard to business and industry than slight imperfections of governmental administration and legislation.

Such sound attitudes upon the things which concern the country's commercial welfare will quickly cement the confidence of business in the administration if this is not already the case.

Freight Car Shortage Not Likely

ONE by one obstacles which early in the year loomed as barriers to the continuance of good business are melting into the background. Two of the most conspicuous of these were the heavy excess of imports over exports and the possibility of a congestion of traffic. With the sharp swing of the country's foreign trade into a position of favorable balance the first of these hindrances has been wiped from the slate. The magnificant record of the railroads in recent months makes its equally clear that the second threatened obstacle is not to prevail.

For 10 weeks of the current year car loadings have exceeded the mark of 1,000,000. That has never happened in any previous year. The peak of loadings in the past was reached in the fall of 1920. During that season car loadings exceeded 1,000,000 but five times. This heavy freight movement was accompanied by an enormous shortage of cars. The congestion of the railroads proved an unsteadying market factor of considerable importance in the iron and steel and other allied industries.

This year with freight movement records being broken repeatedly, there is no congestion. In fact one of the outstanding features of the iron and steel markets is the promptness of deliveries. This is made possible by the dispatch of the railroads as well as by the situation of mill order books. The season has proceeded sufficiently far now to make certain that the fall is not witness of another gigantic tieup of freight such as was almost universally forecasted at the beginning of 1923.

In the week ended Aug. 24 the railroads had 74,917 freight cars ready for service, over and above the number in use. At the same time there were 2667 surplus locomotives. The lines have been distributing equipment in the agricultural sections in preparation for the crop movement. The ample supply of cars is also directly responsible for the continued large production of bituminous coal, the reports of the roads showing a high per cent of cars being used for soft coal transportation.

The achievement of the roads has been the direct result of a definite and elaborate program mapped out in the spring by executives. The plans have included increased efficiency in the loading and moving of freight, the reduction of the number of cars in bad order and general efficiency plans. New cars have been ordered and delivered and these have added to the effective equipment of the roads. The present prospect is that an acute freight congestion is one worry which will not afflict American business this fall.

Engineering Influence Expands

RECENT adoption by a celebrated French automobile builder of American engineering design and equipment for the remodeling and expanding of his plants represents another notable recognition of the efficiency of modern production methods as conceived and developed in this country. Japan at present is constructing a great engineering works which is to be completely American in its design, equipment and operation. Brazil, India, China, Spain and other countries now are calling upon the skill of American engineers for the development of industrial resources within their realms. In fact, there is scarcely a civilized country with industrial problems or aspirations that is not studying American methods or receiving the benefit of American technical advice.

With the growing participation of American capital in foreign enterprises the American engineer logically has become more of a world figure. Most of his recent notable commissions, however, have come not as a result of the backing of American dollars but by reason of his own unique record for accomplishment. Today, more than ever before, the American engineer entertains the cosmopolitan viewpoint. His influence on the country's political life in this day of spreading internationalism should be the greater thereby.

Signs Point to Fall Recovery

Arrival of September Brings More Cheerful Tone to Many Markets—Buyers Gain in Confidence—Stock Market Has Continued Strong in Face of Adverse News—Summer Production High

BY JOHN W. HILL, FINANCIAL EDITOR

WITH the arrival of September, always suggestive of autumn, indications are pointing more clearly to a recovery of buying. In nearly all lines a more cheerful tone is manifest. In some raw materials the revival has been emphatic. Of chief significance has been the stiffening of some wholesale prices, the broadened demand in a number of lines, and the persistent strength of the stock market in the face of war rumblings abroad and an anthracite coal strike at home. With the news of the Japanese catastrophe and its staggering economic destruction, a new strain has been placed upon financial sentiment.

However, it is upon the domestic markets over the next few months that business men and the stock market are concentrating. In considering the prospect it is well to recall that the summer lull has affected trade sentiment and forward buying. Save in a few lines, it has not seriously depressed the production or distribution of goods, beyond some normal seasonal degree. Industries have continued to produce and deliver against old orders. In the meantime order books have been growing thin and buying has been on a reluctant hand-to-mouth basis. Much of the doubbt of the future has been caused, not by lack of current business, but by fear that new buying would not develop. But new buying is developing all along the line. That is the most encouraging phase of the present outlook.

The iron and steel industry has continued to operate at far above normal levels. Car loadings have surpassed all previous records. In July the index of production of basic industries compiled by the federal reserve board had fallen to 121.6 against the high point of 127.2 in May. But the July number was higher than the peak month of 1920. These facts clearly show that the country has not passed through an industrial lull but a temporary hesitation in buying. This has provided a healthy breathing spell. It has checked the unnatural, runaway tendencies developing last spring. Prices have been liquidated or stabilized, stocks of goods have been reduced where over supplies existed, with some few exceptions, and on the whole the business structure rests upon a firmer foundation.

The Business Trend records a slight decline in building material costs. They now stand 90 per cent above 1913 against 102 per cent above three months ago. This drop is being reflected in some increase in contemplated building.

Index to Business Trend Charts

THIS ISSUE

Subject	Page
Building Cost Index	661
Freight Car Situation	662
Railroad Freight Traffic	662
Security Prices	662
Copper Prices	663
Foreign Exchange	663
Iron and Steel Foreign Trade	663
Cotton Consumption	664
Foundry Pig Iron Market	664
Iron and Steel Price Parity	664

REFERENCES

Bank Clearings	Aug. 30
Electric Power Production	Aug 30
Independent Sheet Situation	Aug. 30
Iron and Steel Price Index	Aug. 30
Monthly Coke Output	Aug 30
Steel Castings Bookings	Aug. 30
Structural Awards	Aug 30
Automobile Production	Aug. 23
Building Construction	Aug. 23
Business Index	Aug. 23
Foreign Exchange	Aug. 23
Foreign Trade	Aug. 23
Monthly Ingot Production	Aug. 23
Railroad Earnings	Aug. 23
Car Orders	Aug. 16
Coal Production	Aug. 16
Monthly Incorporation	Aug. 16
Monthly Pig Iron Chart	Aug. 16
Prices and Failures	Aug. 16
Steel Orders	Aug. 16
Dollar Purchasing Power	Aug. 9
Monthly Commodity Prices	Aug. 9
Steel Earnings	Aug. 9
Aberthaw Index	July 26
Farmer Purchasing Power	July 19
Monthly Alien Migration	July 12
Steel Output Per Capita	July 5
Wholesale Trade	June 21
State of Credit	June 14
Wage Factor	June 14
112 Years of Prices	May 3
Freight Factor	April 19
Wages and Living Cost	April 5
Iron and Steel Production Rate	Feb. 1
Long Time Trend of Wages	Aug. 3

The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One mo. ago	One year ago	Average 1913
Business failures	315	324	325	367	...
Cash ratio Fed. Res. System.	77.5	77.9	77.3	79.2	...
Loan rate, 4-6 Mo. N. Y. (per cent)	5	5	5	4	5½-6
Average 25 ind'l shares	$106.67	$104.72	$100.55	$107.02	$58.19
Average 25 rail shares	$58.11	$56.69	$54.97	$68.70	$82.97
Av. 40 bonds	$76.88	$76.70	$76.08	$82.26	$93.00
Car loadings (week ended Aug. 18)	1,035,741	973,162	1,028,927	846,266	*968,103
Bank debits 247 cities (000 omit'd)	....	.....	$8,182,305	$8,720,819	.....	.....

*1920

FOREIGN EXCHANGE (Demand)

	Normal	Sept. 1 (close)	Week before	Month ago	Year ago
Sterling	$4.86	$4.54	$4.55	$4.56	$4.47
Francs	19.3c	5.62c	5.71c	5.83c	7.83c
Lira	19.3c	4.25c	4.33c	4.34c	4.39c
Marks	23.8c	0.000010c	0.000019c	0.00009c	0.07c

MONTHLY COMPARISON

	July	Month before	Year ago	Monthly average 1913
Dodge building Awards in 36 states	$315,024,000	$371,034,000	$415,000,000	$82,126,000
Business failures: Number	1231	1358	1753	1336
Liabilities	$35,721,188	$28,678,276	$40,010,313	$22,732,000
Exports	$310,000,000	$320,000,000	$301,157,000	$207,000,000
Excess of gold imports	$27,406,000	$18,885,000	$42,343,000	†630,716
Bureau of Labor Price Index	151	153	156	100
Braastreet's Price Index	138.7	141.5	130.5	100
Economist's British Price Index	4182	4301	4396	2717
Cost of Living Index	161.9	160.1	155.6	100
New incorporations	$724,920,000	$1,403,336,000	$634,259,000	$172,301,000
Railroad net earnings	*$87,742,000	$89,999,600	$76,271,000	$59,900,000

†Monthly average excess exports. *June.

The Business Trend

September 6, 1923

TRADE TODAY, TOLD BY IRON TRADE CHARTS

GENERAL SITUATION—Turn in business situation becoming more apparent with the passing of Labor day; preliminary activities for autumn trade expanding; resumption of full-time operations in some eastern cotton mills significant; price trend reversing after weeks of decline.

FOREIGN EXCHANGE—Slight improvement in some European exchanges; reflects growing hope for Ruhr settlement; mark's value extinct; German wages have been placed on gold basis.

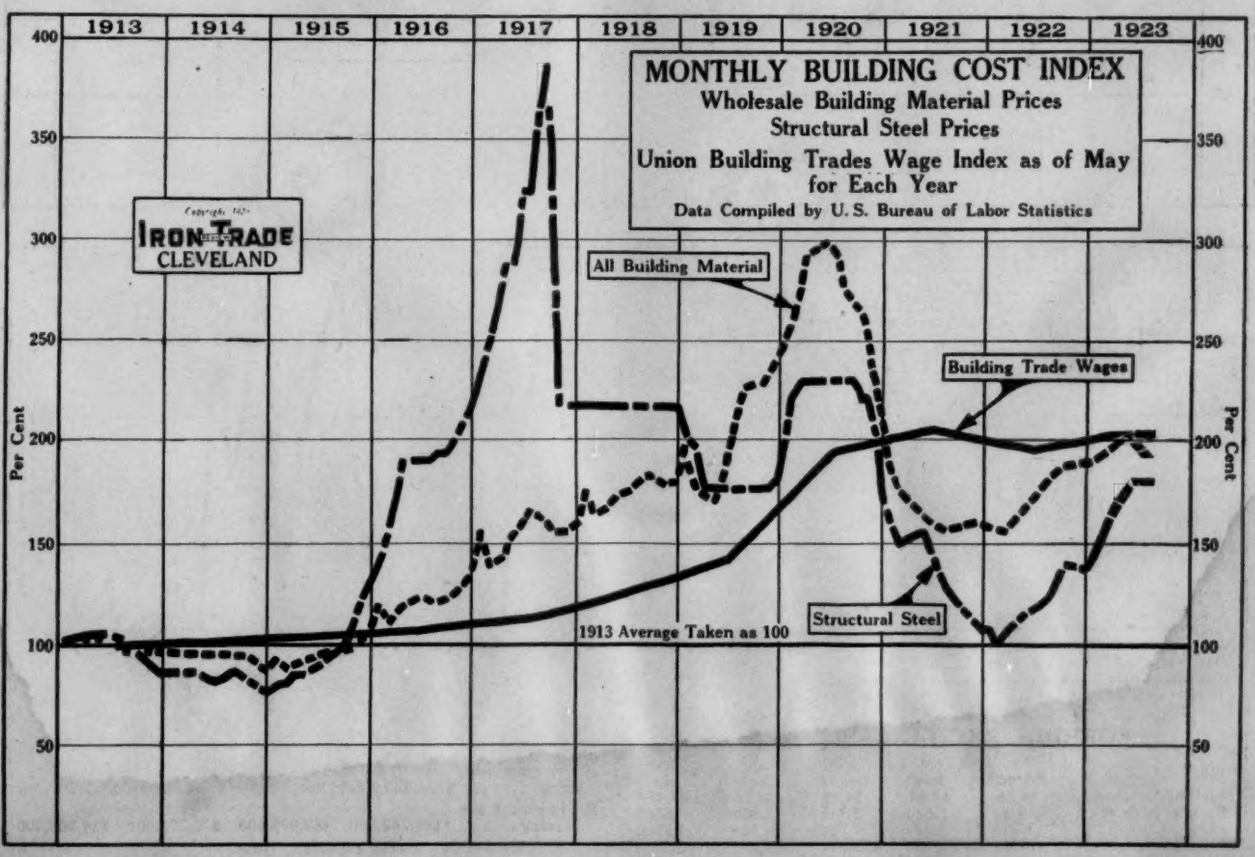
SECURITIES—Industrial shares have made impressive gains during past month; average for 25 leading stocks advances nearly 5 points; gains range from 2 to 18 points; rails less active.

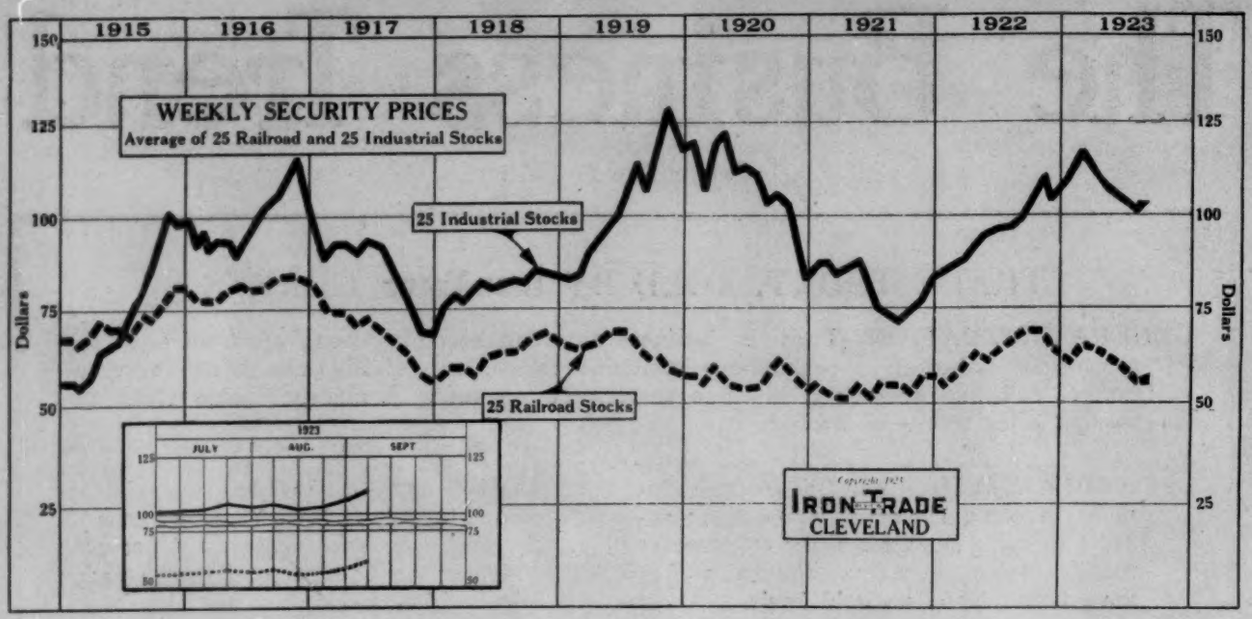
COTTON CONSUMPTION—Consumption of cotton in July was 26 per cent under May peak; cotton goods demand now best in 60 days; reflects large consumption and good public buying power.

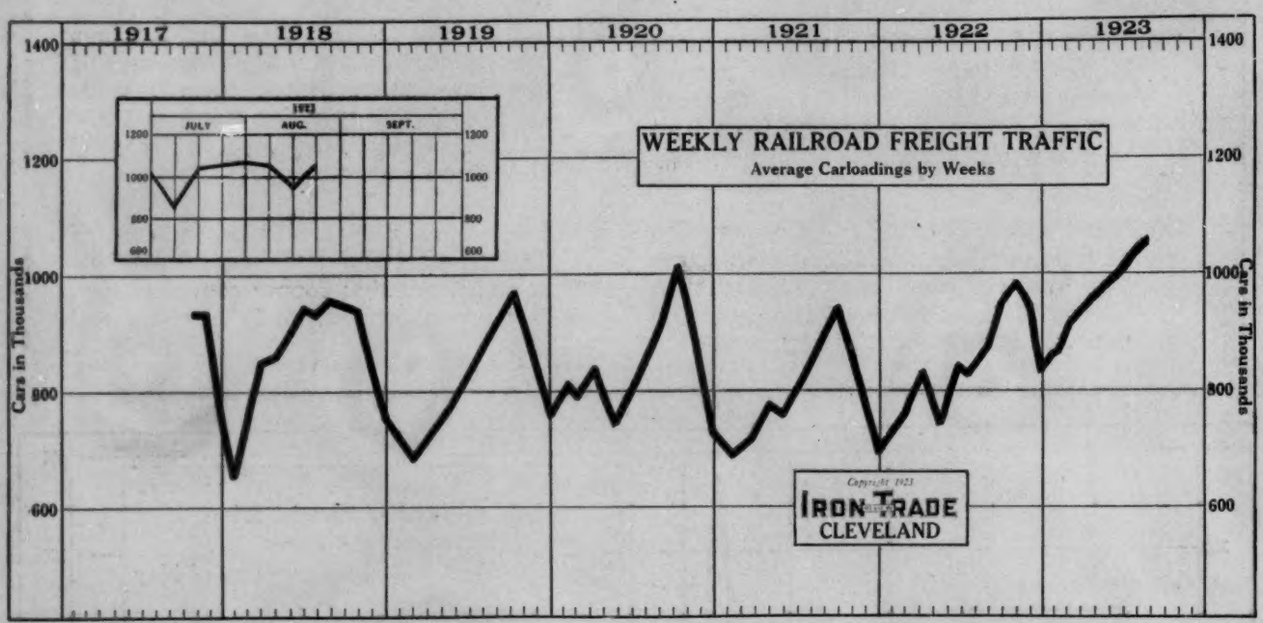
BUILDING COSTS—Building material index of bureau of labor statistics now 90 per cent over 1913 against 104 per cent above in April; structural steel steady; labor still at peak.

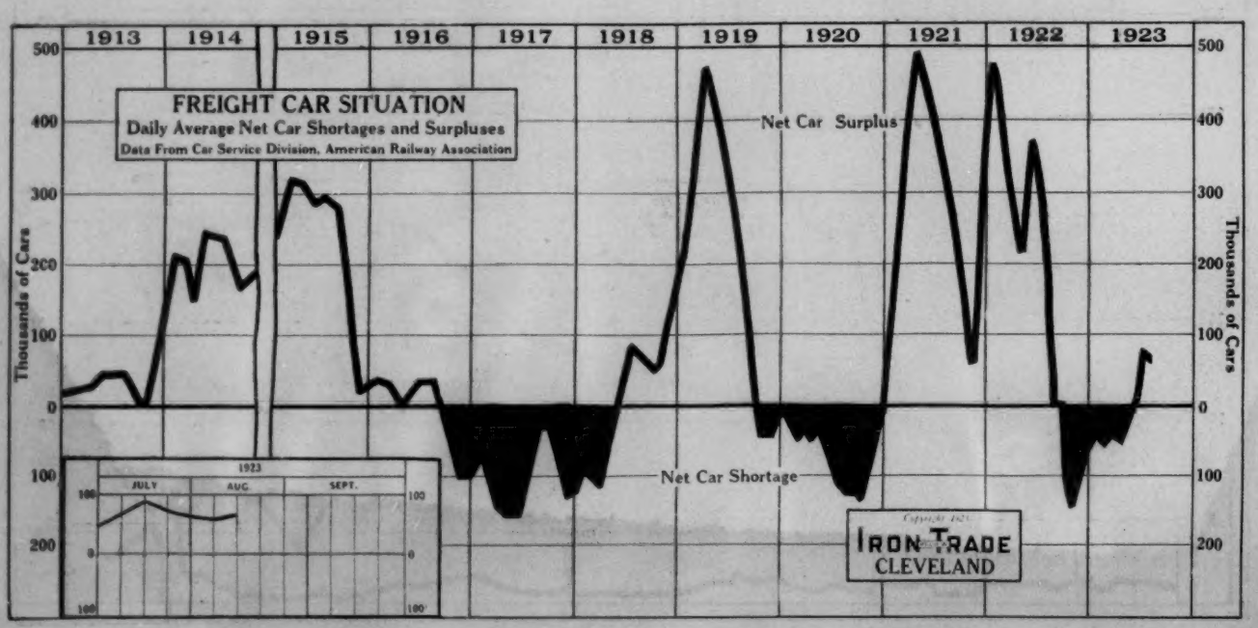
FREIGHT MOVEMENT — Car loadings pass 1,000,000-mark for 10 weeks this year, an unprecedented record; went above 1,000,000 only five times in 1920; total for week ended Aug. 18 second highest on record.

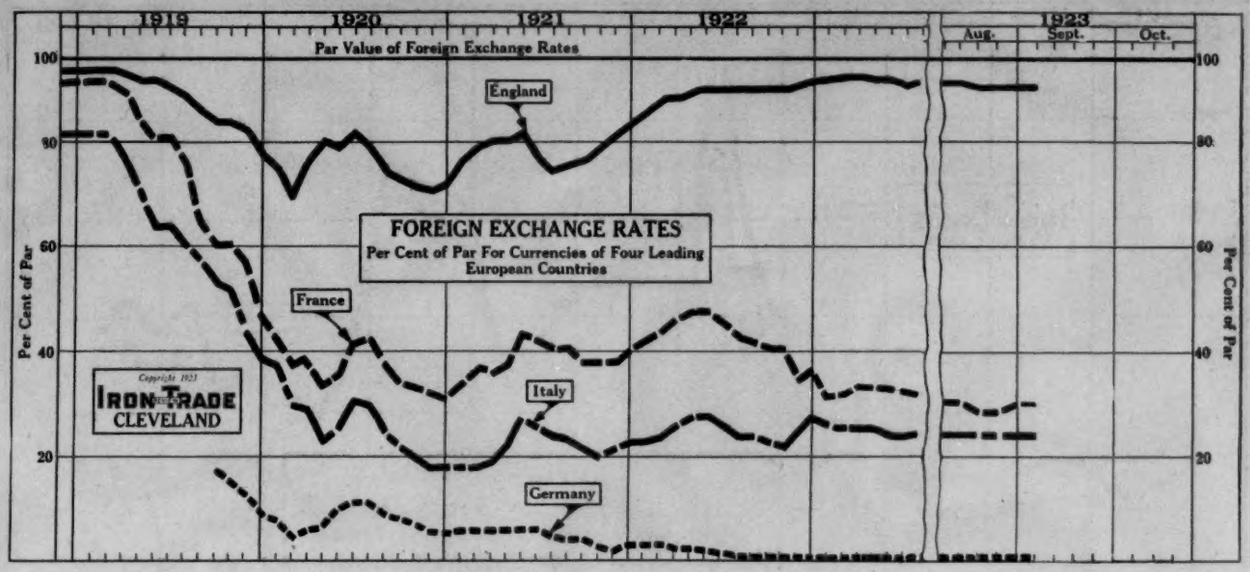
PRICES—Chart shows relative firmness of finished steel and weakness of pig iron in recent months; copper continues low, in contrast to strength in zinc, tin and lead.

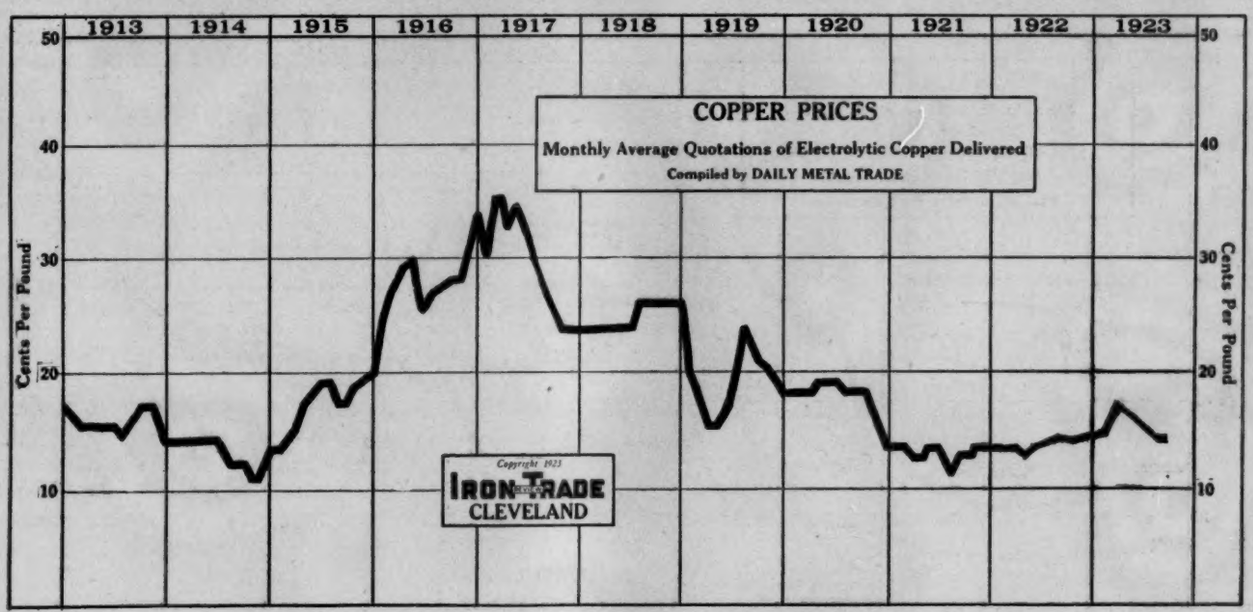


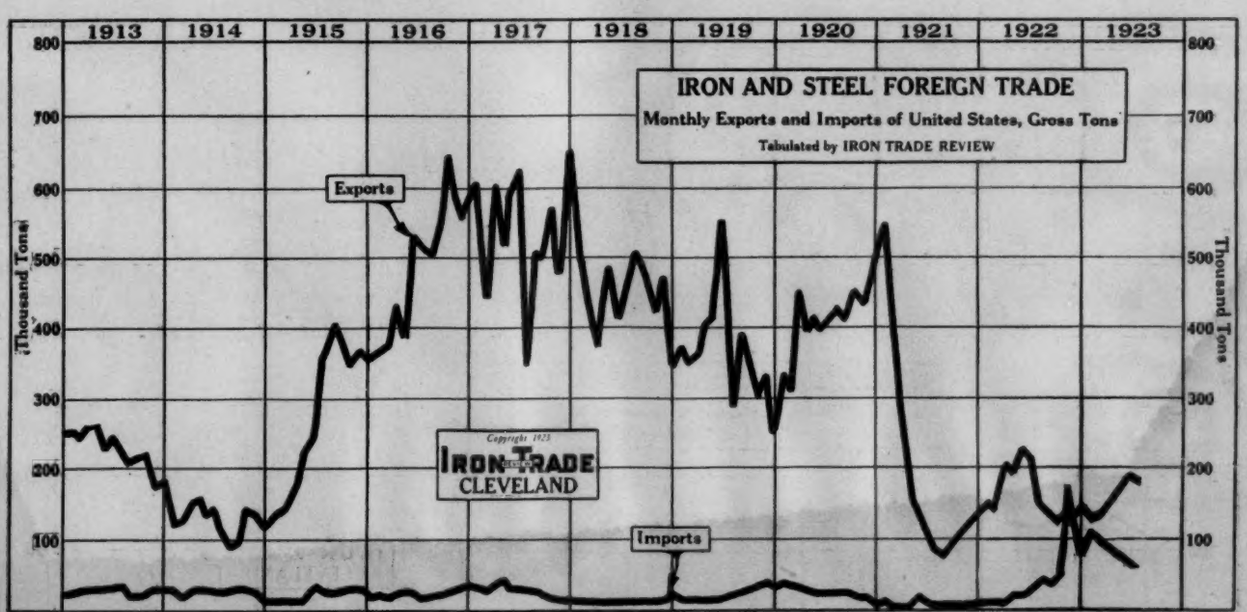

1915
1916
1917
1918
1919
1920
1921
1922
1923
WEEKLY SECURITY PRICES
Average of 25 Railroad and 25 Industrial Stocks
25 Industrial Stocks
25 Railroad Stocks
Dollars
1923
JULY
AUG.
SEPT
IRON TRADE
CLEVELAND

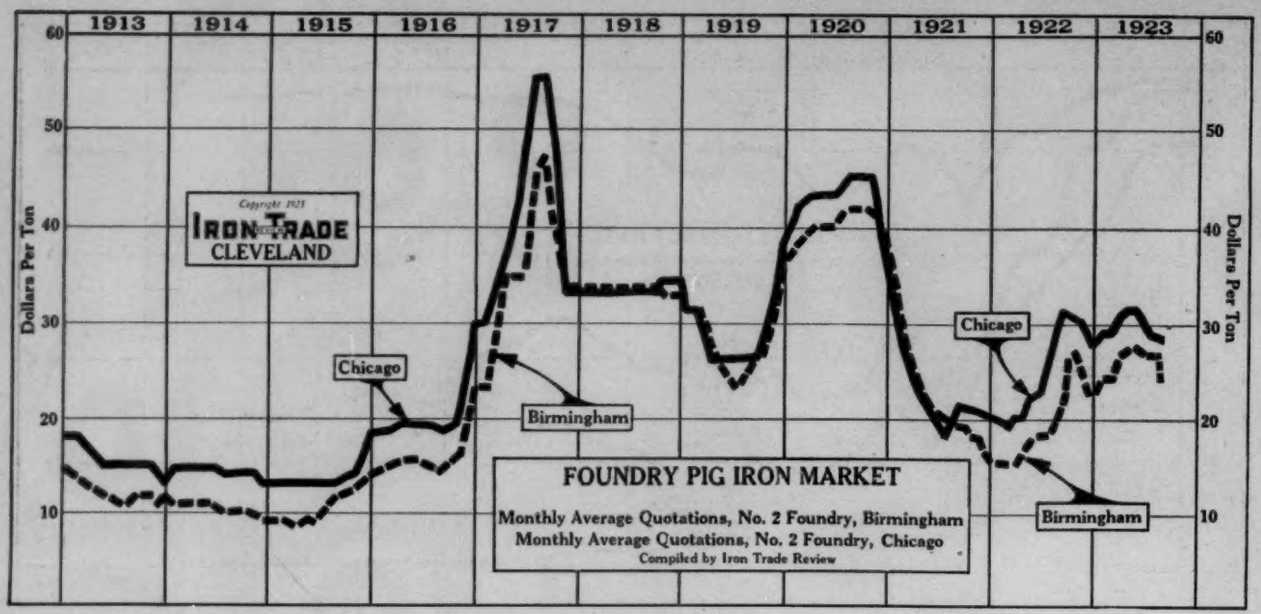

1917
1918
1919
1920
1921
1922
1923
WEEKLY RAILROAD FREIGHT TRAFFIC
Average Carloadings by Weeks
Cars in Thousands
1923
JULY
AUG.
SEPT.
IRON TRADE
CLEVELAND

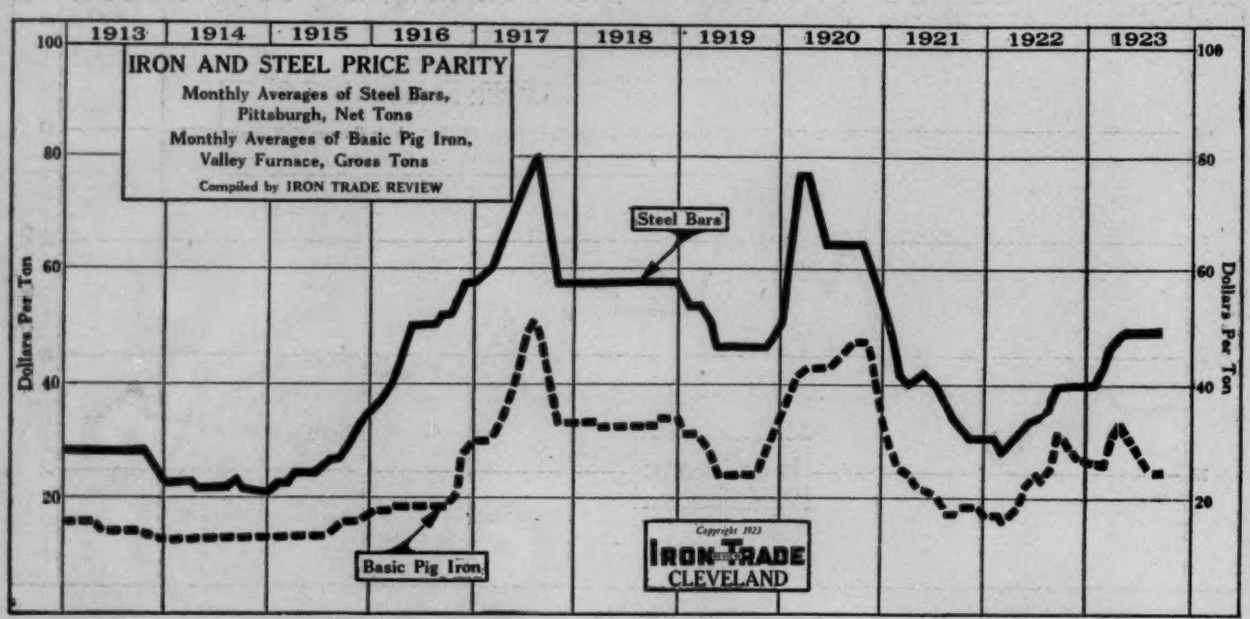

1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
FREIGHT CAR SITUATION
Daily Average Net Car Shortages and Surpluses
Data From Car Service Division, American Railway Association
Net Car Surplus
Net Car Shortage
Thousands of Cars
1923
JULY
AUG.
SEPT.
IRON TRADE
CLEVELAND

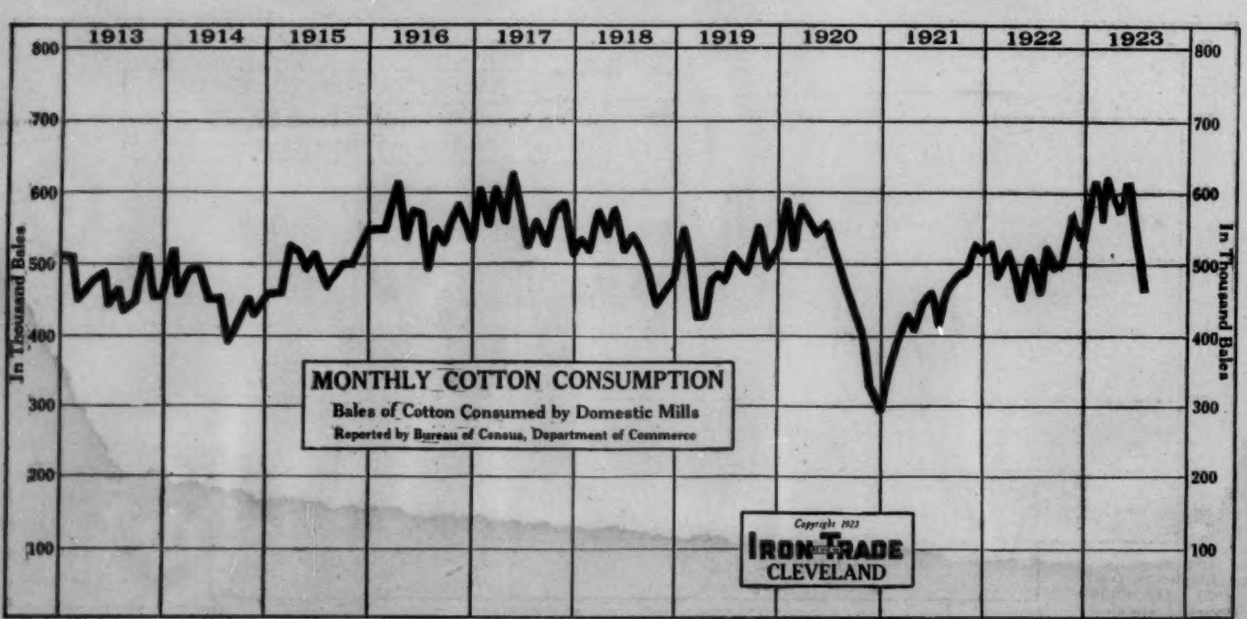

1919
1920
1921
1922
1923
Aug.
Sept.
Oct.
Par Value of Foreign Exchange Rates
England
FOREIGN EXCHANGE RATES
Per Cent of Par For Currencies of Four Leading European Countries
France
Italy
Germany
Per Cent of Par
100
80
60
40
20
Copyright 1923
IRON TRADE REVIEW
CLEVELAND


1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
COPPER PRICES
Monthly Average Quotations of Electrolytic Copper Delivered
Compiled by DAILY METAL TRADE
Cents Per Pound
50
40
30
20
10
Copyright 1923
IRON TRADE REVIEW
CLEVELAND


1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
IRON AND STEEL FOREIGN TRADE
Monthly Exports and Imports of United States, Gross Tons
Tabulated by IRON TRADE REVIEW
Exports
Imports
Thousand Tons
800
700
600
500
400
300
200
100
Copyright 1923
IRON TRADE REVIEW
CLEVELAND


1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
Dollars Per Ton
Copyright 1923
IRON TRADE
CLEVELAND
Chicago
Birmingham
Chicago
Birmingham
FOUNDRY PIG IRON MARKET
Monthly Average Quotations, No. 2 Foundry, Birmingham
Monthly Average Quotations, No. 2 Foundry, Chicago
Compiled by Iron Trade Review


1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
Dollars Per Ton
IRON AND STEEL PRICE PARITY
Monthly Averages of Steel Bars, Pittsburgh, Net Tons
Monthly Averages of Basic Pig Iron, Valley Furnace, Gross Tons
Compiled by IRON TRADE REVIEW
Steel Bars
Basic Pig Iron
Copyright 1923
IRON TRADE
CLEVELAND


1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
In Thousand Bales
MONTHLY COTTON CONSUMPTION
Bales of Cotton Consumed by Domestic Mills
Reported by Bureau of Census, Department of Commerce
Copyright 1923
IRON TRADE
CLEVELAND

Heating Cast Rolls Electrically

Electric Span Heaters Used in Warming Finishing Rolls of Sheet and Tin Mills—Practice Assists Production and Reduces Loss from Roll Breakage—Power Cost Is Reasonable

BY GORDON FOX

THE finishing rolls of practically all sheet and tin mills are made of cast iron. In order that the working surface of the rolls may have sufficient wearing qualities this portion of the roll is cast in an iron mold which causes the molten metal adjacent thereto to solidify quickly. The carbon in this rapidly cooled iron remains in its combined state. The chilled portion of the roll has a white crystalline structure and is hard and brittle. The clear chill ordinarily has a depth of about ½ inch to 1 inch which tapers off gradually. The entire center portion of the rolls, including the necks and wobblers, is gray iron which has been cooled sufficiently slowly to permit the carbon to assume graphite form.

This composite structure of the rolls is primarily responsible for roll breakage. The chilled outer portion of the roll has an expansion rate about twice as great as the inner gray iron portion. Thus the dimension *A*, Fig. 1, tends to expand twice as rapidly as dimension *B*. This may cause shearing stress along some such line as *C*, compression along the line *A* and tension along the line *B*. Similar forces occur in an axial direction. Also, due to the more rapid expansion, the chilled portion tends to pull away from the central portion of the roll, setting up radial tension forces. These conditions would exist even if the roll were uniformly heated. They are decidedly aggravated by the fact that the rolls are heated from the outside and the external portions are permitted to reach fairly high temperatures before the interior is perceptibly heated. The combination of materials having different rates of expansion, heated at different rates and to different degrees, particularly in view of the hard and brittle nature of the chilled metal which is subjected to stress, renders care in the treatment of rolls highly desirable.

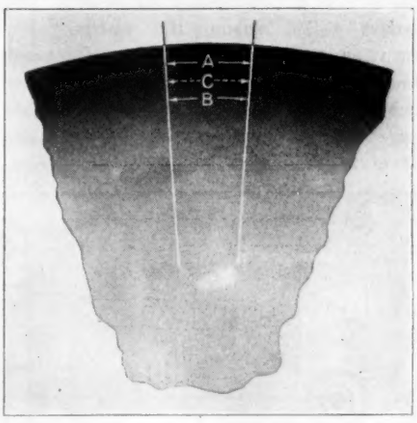
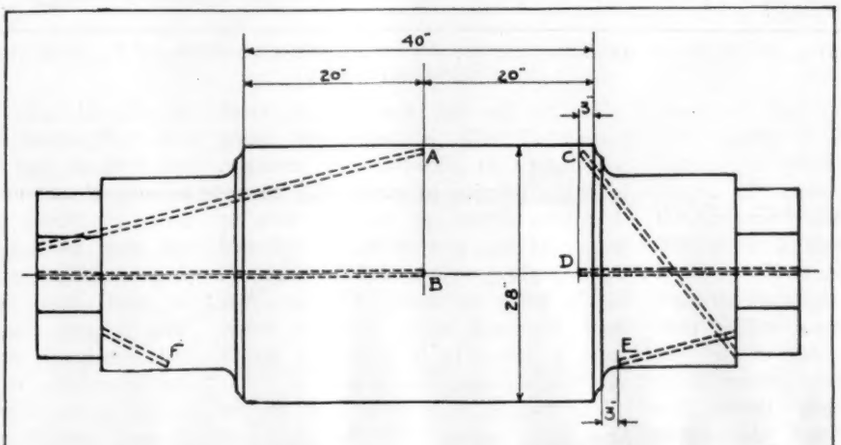


FIG. 1—DIAGRAM SHOWING STRESSES IN FINISHING ROLL

The finishing rolls of a sheet mill or tin mill are operated dry and hot. The cooling of the pack thus is minimized. As the hot pack is in contact with the central portion of the rolls the heat enters the rolls at this point. The ends and necks of the rolls are naturally cooler than the center as their heat is dissipated through contact with the bearings and otherwise. Moreover, in order to maintain proper lubrication of the roll necks and prevent burning of the grease, water cooling of the roll ends is ordinarily employed.

In order to obtain sheets having uniform gage across their width it is necessary that uniform pressure be maintained across the pack as it passes between the rolls. This means that the contour of the upper and lower rolls must be parallel. Due to the fact that the temperature of the center of the rolls is higher than the ends, the rolls expand more in the center, increasing their diameter. In order to compensate for this effect one or both rolls are turned to have a slight concavity of contour when cold. This is termed "crossing" the rolls for the reason that, in turning, the straight roll (or sometimes a straight edge) is placed above the roll to be given concavity. The straight roll is crossed slightly and the roll being turned is fitted to this crossed roll, resulting in a concave contour. When the rolls attain working temperature, the expansion causes the straight roll to become slightly convex and the concave roll decreases its concavity to such an extent that uniform gages are obtained. If a mill has too much concavity it is said to be "hollow" and the pack has horns or fish tails. If the mill is "full" in the middle, the pack is longer in the middle than on the sides and the sheets are rolled thinner in the center than they are on the edges.



Point A — 703 to 736 deg. F.
" B — 641 to 674 deg. F.
" C — 510 to 542 deg. F.
Point D — 378 to 483 deg. F.
" E — 399 to 447 deg. F.
" F — 330 to 366 deg. F.

FIG. 2—PYROMETER ARRANGEMENT FOR OBTAINING ROLL TEMPERATURES AND READINGS DURING NORMAL OPERATION

Finishing mills are usually operated at temperatures between 550 and 750 degrees Fahr. at the hottest point. Tests made by the United States Steel Corp. a few years ago proved that the chilled portion of the roll has the greatest resistance of breakage stresses at about 750 degrees Fahr. The strength diminishes only slightly at lower temperatures down to 350 degrees Fahr.

From a paper presented at the Chicago sectional meeting of the Association of Iron and Steel Electrical Engineers, April 11, 1923. The author is electrical engineer, Freyn Brassert & Co., Chicago.

below which point a material weakening was found. At temperatures above 750 degrees Fahr. the strength was found to diminish until, at a temperature of 875 to 900 degrees Fahr., which is a low red heat for cast iron, breakage occurred readily under comparatively light stress.

The distribution of heat in the rolls under normal operating conditions is shown in Fig. 2. These temperatures were obtained in a test made at the Vandergrift plant of the United States Steel Corp. from thermocouples inserted in the top roll, collector rings being supplied to connect with the meter. The mill was rolling light-gage sheets and care was taken not to exceed safe temperatures. These temperatures probably are representative of good practice. It should be noted that the surface temperatures at point *A* and *C* indicate about 200 degrees Fahr. difference.

Due to the fact that rolls are stronger and less brittle at normal rolling temperatures and, further, due to the fact that the rolls have their proper shape only when heated, and, further, to minimize expansion and contraction stresses, it is highly desirable that roll temperatures be maintained as uniform as possible at the best operating point. On fast schedules it is possible to bring the rolls to a dull red heat. In order to restrict roll temperatures to safe limits, it is customary to cool the rolls, either with dry steam or with air.

In starting a cold mill, a number of difficulties are met, as follows:

Due to the fact that the rolls must be raised from a uniform low temperature to a nonuniform high temperature, expansion stresses are inevitable.

As the fill is "hollow" until full temperature is attained it is not in best condition to roll wide orders and narrow gages. It is customary to restrict the orders rolled during the warming up turn or turns to narrower widths and heavier gages. Depending upon the demand and the market conditions this may be of considerable disadvantages from a production and sales standpoint.

Due to the fact that the too rapid heating of rolls is undesirable, being contributory to excessive roll breakage, it is the practice in many mills to restrict the output on the first turn or turns. If this practice is not followed there is always the probability that roll life is being sacrificed. On the other hand, restricted output naturally represents a loss. It is largely a matter of choice between two evils.

The rolling of narrow iron on the first turns concentrates the wear on the mill to some extent and probably decreases the total usage on wide iron which might be obtained from a set of rolls. Aside from the necessity of warming up the mill, it would seem to be the more desirable practice to roll wide iron during the early part of the week while the surface of the rolls is in best condition and to roll the narrow iron the latter part of the week after the rolls are worn.

The lubricant used for the roll necks is necessarily suited to the high temperatures incident to normal operation. When a mill is started cold the lubricant is stiff and the friction is high. This not only increases the power required but it sometimes leads to breakages. Moreover, since the upper roll usually is driven by friction from the lower roll or the pack, slippage is likely. This may contribute to gathering and roughness of the rolls.

It is probably the practice in the majority of mills to warm up on crop ends and narrow iron. Just how much roll breakage may be attributed to strains brought about during the warming up period can hardly be definitely ascertained but when we consider that a cold roll, in a sensitive condition, is subjected to its most severe stresses at this time, there is good reason to believe that no little damage is done during the warming up period. In an article which appeared in the May, 1922, issue of *Blast Furnace and Steel Plant*, W. H. Melaney makes the following statements:

"First: The chilled surface of the roll has an expansion approximately twice that of the gray granular interior.

"Second: Under all the present day processes of warming up, this chilled surface of the roll is the first part to be heated, thus accentuating an al-

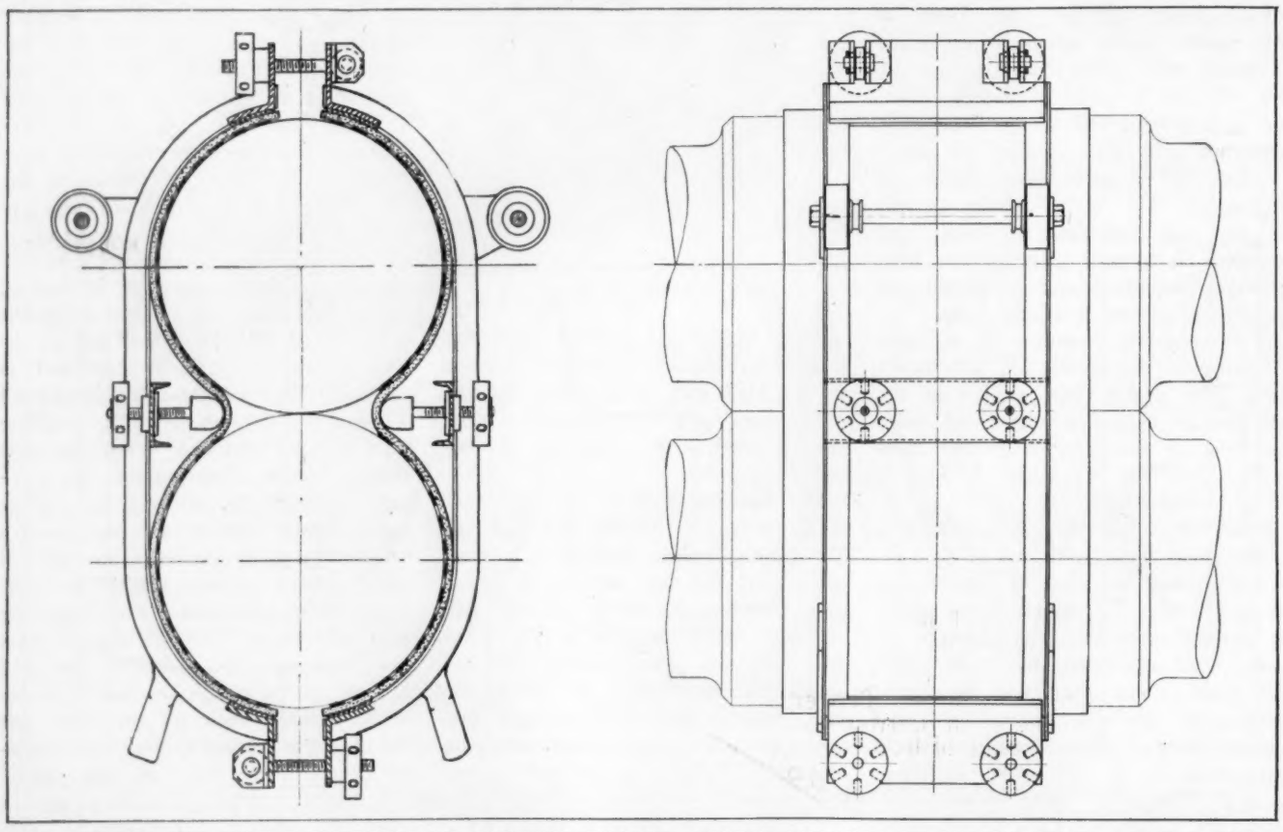


FIG. 3—FRONT AND SIDE ELEVATIONS OF ELECTRIC HEATING DEVICE EMLOYED BY INLAND STEEL CO. FOR WARMING FINISHING ROLLS

ready precarious condition, as the chilled surface must of necessity become quite hot before the gray metal behind it is even warm. This is conclusively shown when rolls sometimes break before a half dozen bars have been rolled on them and when the heat in the roll is not sufficient to even discolor the fracture and in deep chilled rolls many are broken simply by the warming up and before even a bar has been rolled on them.

"Third: Many seemingly perfect rolls are broken during the warming up process when there is no pack in the mill. This is caused by the surface of the roll becoming heated so rapidly that the interior of the roll did not get warm enough to expand the slight amount its prepondering mass would require, to take care of the very rapid expansion of the face or chilled portion, and the roll is torn in two.

"Fourth: It is a known fact that most of the roll breakage occurs in the fore part of the week before the rolls have reached their final working temperature, also there is more breakage in the extremely cold winter months than in the summer time, due to the lower temperature at which the warming up starts and it is the writer's opinion that no matter when the roll actually lets go the condition that finally put it out of commission was started on the warming up turn."

The importance of the question of roll breakage is evidenced by the records of one mill which show that only 15 per cent of the rolls are discarded due to the fact that they have been dressed down below the chill. The other 85 per cent are lost through breakage. Some of the rolls serve over 100 days, some serve less than 10 days. The average for this mill is about 47 days.

A 28 x 44-inch roll weighs about six tons and costs about $70 per ton or $420. The scrap value is about $15 per ton or $90. Whatever labor is put on the roll is lost when it breaks. If a roll breaks when it has served but half its useful life, the loss is $150 or more. If roll breakage can be decreased, the possibility for saving is worth while.

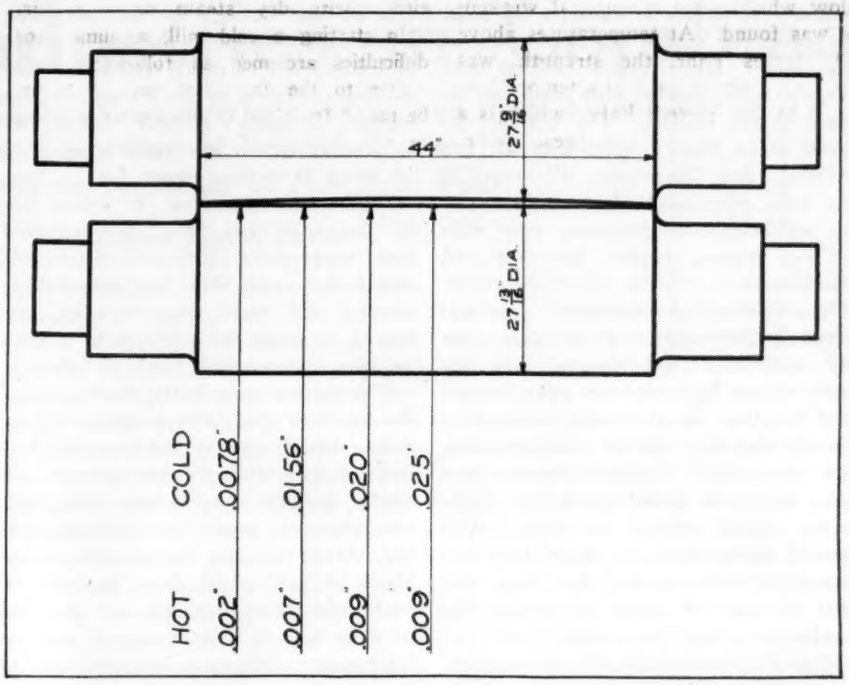


FIG. 5—CLEARANCE DUE TO CONCAVITY OF UPPER ROLL WHEN ROLLS ARE COLD AND WHEN ELECTRICALLY HEATED

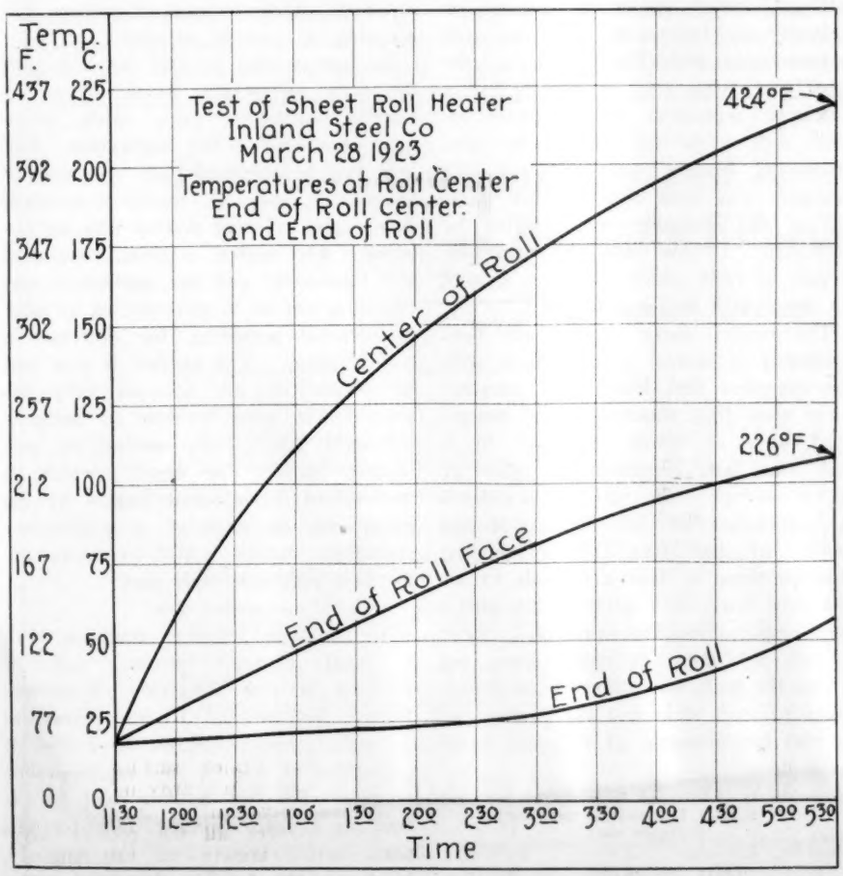


FIG. 4—CHART SHOWING TEMPERATURES AT CENTER OF ROLL, END OF ROLL FACE AND END OF ROLL IN ELECTRICALLY HEATED ROLL

Rolls which have a deep chill are more sensitive and more subject to breakage than those having a shallow chill. Thus new rolls are more sensitive in this respect than old rolls which have been repeatedly dressed.

In the foregoing we have mentioned some of the considerations which render it desirable that rolls be carefully preheated before rolling. A number of methods have been tried and some are now in use. Hot water and steam are both used to extent and gas burners are applied to the rolls in some mills. Hot gases from the heating furnaces have been blown on the rolls in some cases. All of these methods have limitations.

About a year ago the Inland Steel Co. undertook the development of a device for heating the rolls electrically. After a period of experiment, equipment was evolved consisting of a light angle frame, built in two halves and vertically split, as shown in Fig. 3. Space heaters are used as the heating medium. The heaters used are of special dimensions and rating and somewhat special construction. The heating units are mounted in a flexible member which is attached to the frame. The heating units are suitably backed up by heat insulation enclosed between sheet metal protecting plates. The design has been developed to take care of

ordinary variations in diameter of rolls. As shown in Fig. 3, the two halves of the heater are clamped to the stationary rolls, usually after they are in place in the housing. The heating elements make direct contact with the roll surface, thus conveying the heat to the rolls effectively. The heating units do not acquire temperatures more than a few degrees higher than the roll temperature.

The device as originally developed required the service of the crane for its application and removal. It has been found possible to place wheels and handles on the units in such a manner that they may be readily handled, like a truck. Further, means have been devised to enable the heaters to be easily applied without the crane. With certain improvements in design, now contemplated, we expect that two men will be able to apply or remove the heaters in about five minutes.

Fig. 4 gives an idea of the temperatures afforded with the heater and the distribution of heat in the roll. These curves were prepared from data taken in a recent test on a pair of 28 x 44-inch rolls. The rate of heating indicated was obtained by continuous application of about 28 kilowatts of energy for a period of six hours. The total power consumption of about 170 kilowatt hours represents a cost of about $2.00 for the heating period. It will be noted that a maximum temperature of 424 degrees Fahr. was obtained at the center of the roll face and 226 degrees Fahr. at the end of the roll face after six hours' heating. This represents a temperature difference of 198 degrees Fahr. which corresponds closely with the temperature difference between these points existing when the rolls are in normal operation.

Better Results Possible

The results shown in this test do not necessarily represent the best that can be secured. First, it may be definitely stated that temperatures higher than 424 degrees Fahr. may be attained, if desired either by longer or more rapid heating. In the above test the voltage was 15 per cent low. As the heat produced varies as the square of the voltage, this reduced the heating ability of the equipment 28 per cent. The heating units will stand considerably higher temperatures without damage.

The more rapid the heating, the more the center of the roll is heated and the less the heat has time to flow to the roll necks and ends. Moreover, with rapid heating, the roll surface is no doubt considerably hotter than the roll interior although probably much less so than with gas flame heating. It is entirely possible to govern the distribution of heat through the roll according to the rate of input to the heater which, of course, may be easily regulated. Considerable remains to be learned in this regard. It appears probable that it may be best to operate the heaters connected in series at reduced input for an hour or two until the frost is driven out of the rolls and they have attained some temperature fairly well distributed; the heaters can then be connected in parallel and more rapid heating employed to bring the rolls up to suitable working temperatures and to shape.

The heating units in the electric heater do not cover the entire periphery of the rolls. Small arcs at the top and bottom of each roll are not covered. It might perhaps be thought that this would lead to nonuniform heating, leading to stresses and nonuniform expansion. As an actual fact, the rate of heat input is low enough and the rate of heat flow is high enough so that no temperature differences of any moment occur. Repeated tests have failed to show temperature differences greater than 15 degrees Fahr. between different points around the circumference of a roll. The upper side of the roll is usually 5 to 10 degrees warmer than the lower side and differences of 4 to 5 degrees are not exceeded over any quarter circle arc.

The effect of electric preheating on the shape of the rolls is well shown in Fig. 5 which shows the amount of concavity or cross in the rolls discussed in connection with Fig. 4. It will be noted that, when cold, these rolls had a maximum separation at the center of 0.025 inch. At the end of the sun, after the heaters were removed, the clearance was 0.009 inch. Thus about 2/3 of the concavity was removed by preheating. This test was made on a pair of rolls which had been dressed to about half the original chill.

The results above shown have been confirmed in several previous tests with the exception that lower final temperatures were then obtained as the heaters used were of lower capacity. In a test run last November, a pair of 28 x 44-inch rolls was pre-heated to a temperature of 348 degrees at the center of the face. After running through three or four crop ends to set the mills some 28 x 30 x 96-inch orders were run. The first pack had about 12-inch fish tails. A sample strip, cut across the pack, was calipered, the dimensions of each strip and the average of several measurements of the pack being as follows:

Measurements of thickness in inches of first pack (28 x 30 x 96) and the individual sheets in same

Sheet No.	Left edge	Center	Right edge
1	0.0111	0.0124	0.0112
2	0.0103	0.0144	0.0120
3	0.0109	0.0143	0.0120
4	0.0105	0.0140	0.0110
5	0.0120	0.0147	0.0118
6	0.0120	0.0146	0.0113
7	0.0136	0.0145	0.0134
8	0.0112	0.0128	0.0117
Average	0.0114	0.0140	0.0118
Total	0.0917	0.1117	0.0946
Measured thickness of pack	0.1081	0.1144	0.1056

Individual sheets are about 0.002 heavier in center than ends.

Pack is about 0.008-inch heavier in center than ends.

In considering this data, cognizance should be taken of the fact that this mill was found to be hollow the entire week and fish tails 8 to 10 inches resulted on the same order on succeeding turns. Orders of 28 x 36 x 96 inches have been successfully rolled on the first turn after preheating with the electric heater. In view of the fact that the rolls can be brought nearly to normal operating temperatures and shape by electric preheating, there is good reason to believe that practically all limitations both as to character of orders and quantity of output may be safely removed by this practice.

Warming Up Is Avoided

Although the heaters usually are applied to the rolls on Sunday evening for a few hours prior to the first turn it is also possible to apply them to a pair of rolls placed in a suitable stand. Thus, in case it becomes desirable to change rolls during the week, a preheated set may be installed and the necessity of a change of orders for warming up may be avoided.

In summarizing it may be said that the same advantages which accrue to electric heating in many other operations also occur in this application. The heat may be effectively and economically applied. It may be readily controlled. Any degree of heat desired may be obtained. The method is clean, convenient and economical and the application and operation can be so governed as to offer considerable possibility for decrease in roll breakage. The method is new and its possibilities are not yet fully developed. It gives promise of being a thoroughly satisfactory method of preheating rolls. The benefit which it may afford is measured largely by the importance or need of a satisfactory preheating method. Mill operators are the best judges of this need.

A miniature foundry, equipped with a small electric furnace, will be installed in the Milwaukee Vocational School, Seventh and Prairie streets, as a further development of the course of instruction in foundry and machine shop practice. Part of a floor will be rebuilt as a charging floor, bids for this work having been called for Aug. 24, to close Sept. 4. The furnace has not yet been ordered.

German Industries in Combine

Less Than Dozen Great Groups Control Whole of Iron and Steel Manufacturing Companies and Large Part of Related Plants—Movement Accelerated by Action of French in Ruhr

European Special Service

THE extent to which recent developments in Germany has accelerated the combination of great groups in the iron and steel industry of that country is one of the pronounced features of the European situation at present. Interests which ordinarily would be competitors have been combined, and the French occupation of the Ruhr has tended to intensify this movement rather than retard it.

The result is that the whole of the German iron and steel industry, and a large part of the related engineering, shipbuilding and machinery manufacturing concerns in the country are at the present time controlled by less than a dozen great groups.

The composition of the groups is very complex and their ramifications are unusually wide. Recently the tendency has been toward the combination of foreign concerns with strong German groups, such as the latest merger of what is now the Polish Bismarckhutte with Hugo Stinnes' Alpine Montan Gesellschaft in Austria. Other recent mergers have been in the direction of securing fuel supplies and in developing sales connections at home and in foreign countries.

The process of combination is now more or less complete, and for this reason the accompanying table, which presents for the first time in an American publication, the details of the mergers in the German iron and steel industry is exceedingly interesting. A study of this summary shows clearly the character of the industrial machine with which the French are now grappling. In magnitude it is not overshadowed by the United States Steel Corp., while in range of products and control of iron, steel, and nonferrous metal consuming industries there is nothing like it elsewhere in the world. It shows what might have happened in the United States had it not been for the tendency of American industry, influenced by the Sherman act, to develop competitively.

Ruhr To Remain Important

Whatever political settlement may be arrived at, it is not likely that in the long run the importance of the Ruhr as an iron and steel center will be diminished. Certain working arrangements eventually will be made with the Lorraine interests, but the Ruhr probably always will remain Europe's greatest seat of ferrous production. Fortunately the resumption of normal business activities, as soon as a political settlement is reached, is favored by the unusual concentration which now prevails in the German iron and steel industry.

The reaction of the great German iron and steel combinations to the struggle now being waged between the Gaul and the Teuton, and their eventual influence on world business conditions, will be a matter of intense interest in the future wherever the economics of industry are being studied.

In this connection it is significant to note that the French Schneider & Co. have become represented in the Alpine organization of Austria, in which Hugo Stinnes also is interested. The Schneider officials recently withdrew from the Comite des Forges. The Alpine company doubled its capitalization to pay for plant improvements and for coal mines in Upper Silesia belonging to the Kattowitzer Bergbau, A. G.

Details of German Iron and Steel Combinations as Recently Effected

The Haniel Group

(1) Gutehoffnungshuette A.G., Oberhausen	Coal, coke, pig iron, steel, rolled products, machines, wire and wire products.
(2) Haniel Mines—	
(*a*) Neumuehl	
(*b*) Rheinpreussen	Coal and coke.
(*c*) Zollverein	
(3) Osnabrueck Kupfer und Drahtwerke, Osnabruck	Plates, wire, copper aluminum, bronze and other alloys, iron and steel, wire rods.
(4) Esslingen Maschinenfabrik, Esslingen	Locomotives, machines, boilers, bridges, iron and steel foundry.
(5) Nuernberger Eisenwerk Tafel, Nuremberg	Bar iron rolling mill, screws and small iron products.
(6) Oberhausener Stahl-und Eisengiesserei Schulte-Kulkmann, Oberhausen	Steel and iron foundry.
(7) Neuwalzwerke A.G., Bosperde	Iron and steel wire and wire products, brass copper and bronze wire and plates.
(8) J. Gondriaans Industrien Export Mij., Delft, Holland	Export trade.
(9) Lease of the Rivet Works of L. Moebling, Schwerte	Rivets.
(10) Deutsche Werft Ges., Hamburg (in participation with A.E.G. and the Hamburg Amerika Linie).	Shipbuilding.
(11) Waggonfabrik Uerdingen (Community of Interests)	Railroad cars, street cars, etc.
(12) Maschinenfabrik Augsburg-Nuremberg	Machines.
(13) Haniel & Lueg, Duesseldorf-Grafenberg	Steel castings, machine castings, forgings, rolling mill machinery, hydraulic presses, accumulators.
(14) Hohenzollern A.G. fuer Lokomotivbau, Duesseldorf-Grafenberg	Locomotives.
(15) Neue Werft, Walsum	Shipbuilding.
(16) Franz Haniel & Co., G.m.b.H., Duisburg-Ruhrort	Mining and smelting products.
(17) Drahtwerke Boecker & Co.	Wire and wire products.
(18) Walz-und Hammerwerke, Altenhunden	Rolled and pressed products.
(19) Fritz Neumayer & Co., A.G., Nuremberg	

The annual production of the Haniel Group is as follows: Pig iron, 800,000 tons; Ingots, 800,000 tons; Coke, 1,900,000 tons; Coal, 9,600,000 tons.

Details of German Iron and Steel Combinations

(*Continued*)

The Hugo Stinnes Group

The chief concern of Herr Stinnes is the Siemens-Rhien-Elbe-Schuckert Union, consisting of the Deutsch-Luxemburgische Bergwerks-und Huetten A. G., the Gelsenkirchener Berwerks A. G., the Bochumer Verein fuer Bergbau und Gussstahlfabrikation and the Siemens-Schuckert concern. Beyond this however, Herr Stinnes has a multitude of interests, the ramifications of this group comprising some 1388 undertakings. Some of the more important are given in the following table:

Name of Concern.	Product Manufactured or Nature of Business
I.—Gelsenkirchener Bergwerks A. G., Gelsenkircken	Coal, coke, briquets, tar, crude benzol, pig iron, blast furnace products, tubes, castings.
Consists of the following departments:	
(*a*) Schalke Hochoefen, Giesserei, Gelsenkircken-Schalke	
(*b*) Huette Vulkan, Duisburg-Hochfeld	
(*c*) Huesten, Huesten i. W.	
(*d*) Duesseldorfer Roehren- und Eisenwalzwerke, Dusseldorf; and Raab, Karcher & Co., G.m.b.H., Dusseldorf	Coal, coke, briquets.
Schiffswerft der Gelsenkirchener Bergwerks A. G., Flensburg	Ship building.
II.—Deutsch-Luxemburgische Bergwerks- und Huetten A. G., Dortmund	Coal, blast-furnace works, steelworks, steel, castings, girders, rails, bars, hoops, plates wire.
Consists of following departments:	
(*a*) Dortmund	
(*b*) Eisenwerk Rothe Erde, Dortmund (*c*) Horster Werk	
(*d*) Meggener Walzwerke und Puddelwerke	
(*e*) Friedrich-Wilhelmshuette, Muelheim (Ruhr)	
(*f*) Ph. Weber G.m.b.H., Brandenburg (*g*) Nordseewerke, Emden	
(*h*) Karl Schlieper, Gruene i.W. (*i*) Gebr. Knipping, Altena i.W.	
(*j*) Wilhelm-Heinrichs-Werk vorm. Grillo, Dusseldorf	
(*k*) Wagner & Co., Dortmund and Hohenzollernhuette G.m.b.H., Emden	Iron foundries.
Stahlwerke Bruenninghaus A.G., Werdohl, i.W.	Steel works.
Friedrich Thomee A.G., Werdohl, i.W.	Bars, hoops, wire.
Iburger Seilindustrie	Cables.
Carl Berg A.G., Werdohl i.W.	Plates, wire, rods, tubes, etc., made of aluminum, copper, bronze, and brass.
Sueddeutsche Union, Stahlgesellschaft m.b.H., Mannheim	Steel.
Stahl A.G., St. Ingbert	Steel.
H. A. Schulte, Dortmund	Iron and steel and metal products.
Midgard, Deutsche Seeverkehrs-A.G., Nordenham	Shipping.
Mannheimer Dampfschiffahrtsgesellschaft	Shipping.
Rhein- und Seeschiffahrtsgesellschaft, Cologne	Shipping.
III.—Bochumer Verein fuer Bergbau u. Gussstahlfabrikation, Bochum	Steel castings, rails, ties, billets, etc., coal, coke, briquets.
Owns:	
Gewerkschaft Teutoburgia	Coal mines.
Gewerkschaft Friedrich der Grosse	Coal mines.
Gesellschaft fuer Stahlindustrie	Steel.
Eisen- und Stahlwerk Haslach, Haslach	Iron and steel.
IV.—Siemens & Halske, A.G., Berlin	Electrical products.
V.—Elektrizitaets-A.G., vorm. Schuckert & Co., Nuremberg	Electrical products.
VI.—Siemens-Schuckert-Werke G.m.b.H., Berlin	Formed by the Siemens & Halske and the Elektrizitaets A.G. in order to take over the manufacture and sale of heavy electrical machinery.
Interests in:	
(1) Braunschweigische Kohlen Bergwerke	Coal.
(2) Gebr. Boehler & Co., Dusseldorf	Steel tools.
(3) Riebecksche Montanwerke, Halle (Saale)	Paraffin, mineral oils, brown coal products.
(4) Austrian Alpine-Montan Co., Austria	Iron and steel.
(5) Harze Werke zu Rubeland & Zorge	Foundry and machinery factory.
(6) Erftwerke A.G., Cologne	Aluminum.
(7) Rheinisch-Westfaelische Kupferwerke A.G., Olpe i.W.	Copper works.
(8) Rheinisch-Westfaelisches Elektrizitaetswerk A.G., Essen (Amalgamated with Saechsische Kraftwerke A.G., Osnabruck).	Electric power. Founded by Stinnes.
(9) Dinos Automobilwerke, Charlottenburg	Motor transport factory. Formerly Loeb-Automobilwerke.
(10) Niedersaechsische Kraftwerke, Osnabruck	Electric power.
(11) Fabrik fuer Walz- und Bimsteine, Besigheim	Pumice stone.
(12) Greinitz A.G., Gratz	
(13) Rheinische Silika und Chamotteftabrik A.G., Bochum	Silica and chamotte. Formed 1922.
(14) Westfaelische-Anhaltische Sprengstoff A.G., Berlin	Explosives.
(15) Deutsche Wildermannwerke chem. Fabriken G.m.b.H., Berlin	Chemical works.
(16) H. A. Meyer und Riemann chem. Werke G.m.b.H., Hannover	Chemical works.
(17) Neu Rheinau A.G., Rheinau, Baden	Road, canal construction, etc.
(18) Koenigsberger Zellstofffabrik A.G.	Cellulose.
(19) Norddeutsche Zellulose Fabriken A.G.	Cellulose.
(20) Visurgis Heringfischerei A.G., Bremen	Herring fishing.
(21) A. G. Hugo Stinnes fuer Seeschiffahrt und Uebersee-Handel, Hamburg	Shipping.
(22) Deutsche Ost-Afrika Linie A.G., Hamburg	Shipping.
(23) Hamburg Amerikanische Paketfahrt A.G., Hamburg	Shipping.
(24) Woermann Linie A.G., Hamburg	Shipping.
(25) Niederrheinische Dampfschleppschiffahrt Ges., Dusseldorf	Canal and Rhine shipping.
(26) Rhein Kohlen Handels und Reederei Ges., Muelheim (Ruhr)	Rhine shipping and coal trade.
(27) Mannheimer Lagerhaus Ges., Mannheim	Warehouses.
(28) Kohlen Import A.G., Koenigsberg i.Pr.	Coal imports, etc.
(29) Mineraloel Handels- und Beteiligungs G.m.b.H., Hannover	Mineral oil, etc., and imports.
(30) Koholyt A.G., Hamburg	Merchants.
(31) Alcunes Export fuer Metallfabrikate G.m.b.H., Hamburg	Formed in 1922. Export of aluminum, copper and brass in conjunction with Hirsch Kupfer & Messingwerke A.G., Berlin.
(32) A. G. Ostdeutsche Stanz und Emaillewerk, Kuestrin	Majority of capital acquired in 1922. Stinnes may call on one-half of the production. Raw materials obtained from Stinnes.
(33) Ferro A.G., Pest, Hungary	Formed in 1922 with the Britisch Ungarische Bank. Selling organization for products of Alpine Montam Ges.
(34) Jugo-slavische Montan-Syndikat A.G., Agram, Jugo-Slavia	Formed in 1922 with the Kroatische Escomptebank. Selling organization for products of Alpine Montam Ges.
(35) Norddeutsche Oelmuehlenwerke A.G.,j Hamburg	Oil seed mills.
(36) Altonaer Margarinewerke Mohr & Co., G.m.b.H., Altona	Margarine.
(37) Munich Augsburg Gazette	Newspaper.
(38) Buch & Zellstoffgewebe Hugo Stinnes G.m.b.H.	Printing.
(39) Norddeutsche Buchdruckerei Verlags A.G.	Publishers of the *Deutsche Allgemeine Zeitung* and the *Industrie & Handels-Zeitung*. This places Herr Stinnes in control of several newspapers.
(40) Hamburger Verkehrs A.G.	Travel. Participation with Hamburg-Amerika Linie. Owns hotels in Berlin, Hamburg, Frankfurt and other places.

The total capacity of the Stinnes group, per year, is as follows: Pig Iron, 2,900,000 tons; Ingots, 2,400,000 tons; Coke, 4,200,000 tons; Coal, 18-900,000 tons.

Details of German Iron and Steel Combinations

(Continued)

The Krupp Group

Owns:	
I.—Fried. Krupp A.G. Gussstahlfabrik, Essen	Steel products, plates, castings, locomotives, truck, dredgers, boilers, forgings, paper and textile machines, agricultural implements.
Which in turn owns:	
(*a*) Kruppsche Verwaltung der Muelhofener Huette, Muelhofen bei Engers.	
(*b*) Kruppsche Verwaltung der Hermannschuette, Neuwiedam Rhein.	
(*c*) Kruppsche Verwaltung der Saynerhuette Sayn (Rhld).	
II.—Fried. Krupp A.G., Friedrich-Alfred-Huette, Rheinhausen	Billets, shapes, rails, ties, bars, wire rods, steel construction.
III.—Fried. Krupp, A.G., Grusonwerk, Magdeburg-Buckau	Castings, forgings, machinery, cement, oil mill and rolling mill machinery, etc.
IV.—Fried. Krupp, Germaniawerft, Kiel-Gaarden	Shipbuilding.
V.—Fried. Krupp A.G., Stahlwerk Annen, Annen i. W.	Steel castings.
VI.—San Manuel Ore Mine El Pedroso, Seville, Spain	Ores.
Participations:	
(1) Devon Erzeinkaufsgesellschaft, Rotterdam	Ore imports.
(2) Vereinigte Graphitwerke Kropfmuehl A.G., Munich	Graphite.
(3) Passauer Graphitwerke A.G., Passau	Graphite.
(4) Gewerkschaft Mariaglueck	Brown coal.
(5) Bd. Blumenfeld Kommanditges, auf Aktien, Hamburg	Coal trading business. Formed 1922.
(6) Eisfelder Kupfergesellschaft in Gluecksbrunn	Copper.
Communities of interest:	
(1) Gewerkschaft Helene & Amalie, Essen	Coal and coke.
(2) Gewerkschaft Ver. Constantin der Grosse, Bochum	Coal and coke.
(3) Westafelische Drahtindustrie, Hamm i.W.	Wire and wire products.
(4) Capito & Klein, Benrath	Thin plates.
(5) Maschinenfabrik Fahr A.G., Gottmadingen, Baden	Machines.
(6) Maschinenfabrik Buckau A.G., Magdeburg-Buckau	Machines.
(7) Steireische Magnesitindustrie A.G.	Magnesite. Krupp to take 75 per cent. of requirements. Concluded 1922.
New formations:	
(1) Krupp-Ernemann-Kinoapparate G.m.b.H., Dresden	Sale of cinematographs.
(2) Krupp-Fahr-Erntemaschinen-Vertriebsges, m.b.H., Berlin	Sale of agricultural machines.
(3) Kruppsches Verkaufskontor fuer Motorfahrzeuge G.m.b.H., Berlin	Sales organization for motor vehicles.
(4) Van Eupen, Kraftfahrzeugvertriebs G.m.b.H., Essen	Sales organization for motor vehicles.
(5) Vertrieb Kruppscher Kleinbahnen G.m.b.H., Berlin	Sales organization for light locomotives.
It also possesses the majority of shares of the:	
Rheinische Metallwarenund Maschinenfabrik, Dusseldorf	Locomotives, machines, mechanical plant.
Subsidiary concerns:	
(*a*) C. of I. with A. Schuhmann. Dusseldorf	Optical instruments. Concluded 1922.
(*b*) Maschinenverkaufs Syndikat Rhein G.m.b.H., Dusseldorf	Selling organization for machines formed in 1922 in conjunction with De Fries Werke, Dusseldorf.
(*c*) Groeppel-Rheinmetall A.G. fuer Kohlenaufbereitungsanlagen, Bochum	Coal plant. Formed in 1922 with the Maschinenfabrik Fried. Groeppel, Bochum.
(*d*) C. of I. with Gustav Adolf Weitzel Dampfpflug-u. Dampfstrassenwalzen Unternehmung, G.m.b.H., Eisleben.	Formed in 1922. This company takes over the sale of steam ploughs, steam rollers, etc., manufactured by Rheinmetall.

A trading concession has been concluded with the Soviet Government.

The construction of steel transmission-line towers, narrow-gage locomotives, 50-ton tank cars and 50-ton self-unloading freight cars was taken up during the year. The production of motor trucks was 4½ times that of the preceding year, of agricultural machinery, 2¾ times, of textile machinery 4 times and of small machinery, 2½ times.

Phoenix-Wolff-Rheinstahl-Van Der Zypen Group

I.—Phoenix A.G. fuer Bergbau u. Huettenbetrieb	Ore mines, iron and steel products.
(1) Rheihersteig, Schiffswerft & Maschinenfabrik, Hamburg	Shipbuilding and machines.
(2) Kalksteinbruch Schapkothem, Aprath	Limestone.
(3) Dolomitwerke G.m.b.H., Duisburg-Meidrich	Dolomite.
(4) A.G. Duesseldorfer Roehren- und Eisen Walzwerke	Rolled products and pipe.
(5) Saechsische Maschinenfabrik vorm. Rich. Hartmann	Machines.
II.—Rheinische Stahlwerke	Steel works, ore, mining, pig iron.
(1) Braunkohlengewerkschaft Schallmauer, Bruehl	Brown coal.
(2) Foundry formerly belonging to Maschinenfabrik Augsburg-Nuernberg at Duisberg	Foundry products.
(3) Th. Wuppermann G.m.b.H., Schlebusch	Hoops.
(4) Schiffswerft vorm. Jansen & Schmilinsky	Shipbuilding.
(5) Arenberg A.G. fuer Bergbau u. Huettenbetrieb, Essen	Coal mining, smelting works, coke works, brickyards.
(6) Vereinigte Stahlwerke van der Zypen und Wissener Eisenhuetten A.G.	Smelters and railway material.
(7) Felix Bischoff G.m.b.H., Duisburg	Steel castings.
(8) Puddel und Walzwerke Herwig Soehne, Dillenberg	Puddling works and rolling mill.
III.—Otto Wolff, Cologne	Iron trading.
(1) De Fries & Co., Dusseldorf	Cranes, machine tools.
(2) Gas Motor Fabrik A.G., Cologne-Ehrenfeld	Gas engines.
(3) Alfred Wirth & Co., Erkelenz	Boring implements.
(4) Maschinenfabrik Schiess, Dusseldorf	Heavy machinery.
(5) Gewerkschaft Bliesenbach	Lead mines.
(6) Russelsteiner Eisenwerke G.m.b.H., Russelstein, near Neuwied	Iron products.
(7) Werkzeugmaschinenfabrik Grevenbroich vorm. Karl Klingelhoeffer G.m.b.H.	Machine tools. Acquired by De Fries in 1922.
(8) Ehrenfeld branch of Werkzeugmaschinenfabrik A.G., Cologne Ehrenfeld	Name of De Fries Co. and of these two firms changed to De Fries Werke A.G.
(9) Archimedes Verkaufsgesellschaft fuer Schrauben- u. Nieten, G.m.b.H., Dusseldorf	Screws and rivets. Formed in 1922. Formerly consisted of Archimedes A.G. Berlin and Duesseldorfer Eisenhuetten A.G. Majority of shares acquired by Otto Wolff.
(10) Hildener Schrauben und Metallwerke A.G.	Screws and rivets. Interest acquired by Wolff in 1922.
(11) R. W. Schulte, Klettenberg	Screws and rivets. Interest acquired by Wolff in 1922.
(12) Deutsch-Russische Handels A.G.	Formed by Wolff in 1922 for trade with Russia.
(13) Electro-technische Fabrik Rheydt, Max Schorch & Co., Rheydt	Electrical machinery. Wolff has interests together with the Haniel Group.
(14) Deutsche Continental Gesellschaft, Dessau	Electrical machinery. Wolff and Haniel Group interested.
(15) Eisenausfuhr Otto Wolff & Co., Cologne	Export of iron and steel products. Formed in 1922 with participation of Wolff, Phoenix, Rheinstahl, van der Zypen.
(16) Verkaufsgemeinschaft Rheinischer Maschinenfabriken (V.R.M.), Dusseldorf	Sales organization for machines. Formed in 1922 by De Fries Werke in conjunction with Rheinische Metallwarenund Maschinenfabrik, Dusseldorf.

A community of interests contract was concluded during 1922 between the Rheinische Stahlwerke and the Vereinigte Stahlwerke van der Zypen for a period of 50 years, and the community of interests contract between the former company and the Arenberg A.G. fuer Bergbau und Huettenbetrieb was converted into a fusion. Herr Otto Wolff was also elected, together with a director of the Phoenix, on the board of the Allgemeine Elektrizitaets-Gesellschaft, Berlin.

The annual capacity of the Phoenix-Wolff Group is as follows: Pig iron, 1,900,000 tons; Ingots, 2,200,000 tons; Coke, 1,300,000 tons; Coal, 7,800,000 tons.

Details of German Iron and Steel Combinations

(*Continued*)

The Stumm Group

(1) Gebr. Stumm G.m.b.H., Neunkirchen, Saar	Iron and steel, rolling mill products, benzol, tar.
(2) Gelsenkirchener Gussstahl-u. Eisenwerke, Duisburg	Cast steel, machine parts, dynamo housings, wheels, etc.
(3) Annener Gussstahl Werke, Annen, near Dortmund	Open-hearth and crucible steel.
(4) Stahlwerk Oeking, Dusseldorf	Machine parts for light and ordinary railways, machine tools, lead working machinery.
(5) Vereinigte Press und Hammerwerke, Dalhaussen-Bielefeld	Iron and steel products. Majority of shares acquired in 1922 and company liquidated and now carried on as the Dalhausen dept. and Brackwede department of the Gelsenkirchener Gussstahl & Eisenwerke.
(6) Gussstahlwerke Witten, Witten	Crucible and open-hearth steel, rolling mill products.
(7) Eisen-Industrie zu Menden und Schwerte	Wire and wire nails, bars and hoops.
(8) Aplerbecker Aktienverein fuer Bergbau, Soelde i.W	Coal mines.
(8a) Gewerkschaft Minister Achenbach, Brambauer	Coal mines.
(8b) Essener Bergwerks-Verein Koenig Wilhelm, Essen	Coal mines.
(9) Westfaelische Eisen-und Drahtwerke, Langendreer	Wire products.
(10) Fabrik fuer Eisenbahnbedarf Brenne, Hangarter & Co., Haspe i.W	Railway material.
(11) Metallzieherei A.G., Cologne	Metal castings, drawn metal.
(12) Norddeutsche Huette, Bremen	Iron and steel. Also possesses cement factory.
(13) Muenchen Eggenfabrik A.G., Munich	Agricultural machinery. Harrows and liquid fertilizer pumps.
(14) Homburger Eisenwerke A.G.	Fabrication.
(15) Friedrichs & Co., Einwarden	Dockyards.
(16) Bahnbedarf A.G., Darmstadt	Railway material.
(17) Fingerhut-Werke A.G., Vohwinkel-Siegerbusch, and following subsidiary firms:	Community of Interests contract.
(*a*) Gebr. Fingerhut G.m.b.H., Cassel	
(*b*) Kraftwagen A.G., Vohwinkel	
(*c*) Fingerhutwerke A.G. Abt. Kohlfurter Bruecke bei Solingen	Saw factory. Formerly Kohlfuerter Bruecke. Acquired in 1922.
(18) Duesseldorf-Ratinger-Maschinen-und Apparatebau A.G.	Machines. Majority of shares acquired in 1922.
(19) Deutsche Lastautomobilfabrik A.G., Dusseldorf-Ratingen	Motor trucks.
(20) Schaubach & Craemer, Luetzel-Coblence	
(21) Eisenwerk Kraft, Dept. Niederrheinische Huette	Iron and steel products.
(22) Rheinisch-Westfaelische Bauindustrie, Dusseldorf	Building construction.
(23) Deutsche Erdfarben-Industrie & Schwerspatwerke, Burg	Mineral colors, barytes.
(24) Montangesellschaft Saar m.b.H., Crefeld	Mining.
(25) Neuwalzwerk Boesperde A.G., Boesperde	Rolled products.

The majority of shares of the Welter Elektrizitaets u. Hebezeugwerke A.G. formerly belonging to Stumm were disposed of in 1922 to the Rheinsche Handelsgesellschaft m.b.H, Dusseldorf.

The Thyssen Group

(1) Thyssen & Co., A.G., Muelheim	Iron and steel products, machines, large gas engines for electric power production, turbines, pumps.
(2) Aug. Thyssen Huette, Hamborn	Blast furnaces.
(3) Muelheimer Bergwerksverein, Muelheim	Mining, briqnets and coke manufacture.
(4) Thyssensche Eisenhandels G.m.b.H.	Selling organization.
(5) Thyssen & Co., Berlin	Selling organization.
(6) Schachtbau Thyssen G.m.b.H.	Mine construction.
(7) A.G. fuer Huettenbetrieb, Duisburg-Meiderich and its subsidiary concerns—	Hematite, pig iron, spiegeleisen, ferrosilicon, ferromanganese, pig iron.
(*a*) Rhein Kalksteinwerke G.m.b.H., Wulfurth	Limestone.
(*b*) Thyssensche Handelsgesellschaft m.b.H., Dusseldorf	Selling organization.
(8) Handelsgesellschaft der Thyssen Zechen G.m.b.H., Dusseldorf	Selling organization of mining products and fertilizer. Formed 1922.
(9) Krefelder Stahlwerke (Kloeckner Group also interested)	Iron and steel; specialty machine tools; steel automobile springs and seamless tubes.
(10) Maschinenfabrik Rheinland, Crefeld (through Krefelder Stahlwerk)	Machinery.
(11) Flensburg Schiffbau Ges., Flensburg	Shipbuilding.
(12) Bergbau und Huetten A.G. Friedrichs Huette	Blast furnace products.
(13) Geisweider Eisenwerk (Kloeckner Group also interested)	Iron and steel works.
(14) Oberbilker Stahlwerke, Oberbilk	Steel works.
(15) Bremer Vulcan Schiffbau & Maschinenfabrik Vegesack, Vegesack, Bremen	Ship building; also foundry work and machinery.
(16) Press und Walzwerk A.G., Dusseldorf	Rolling-mill products, iron tubes and machine parts.
(17) Stahlwerkvan der Zypen und Wissener Eisenhuetten, A.G., Cologne-Deutz and Wissen	Iron and steel products. Specular steel; pig iron, copper ore, lead ore. Works at Wissen mainly concerned in the production of white metal. Electrical machinery.
(18) Chs. Weuste & Overbeck, G.m.b.H., Duisburg	Electrical machinery.
(19) Heinrich Reiter, Koenigsberg	
(20) Georgs-Marien Bergwerks & Huetten Verein A.G., Osnabruck	Coal and ore mines, pig iron, steel products.

The total capacity of the Thyssen group, per year, is as follows: Pig iron, 1,700,000 tons; Ingots, 1,300,000 tons; Coal, 5,300,000 tons.

The Kloeckner Group

(1) Lothringer Huetten und Bergwerksverein A.G.	Ore and coal mines, blast furnaces.
(2) Hasper Eisen-und Stahlwerke, Haspe i.W	Iron and steel products, pig iron, rolled products.
(3) Koenigsborn A.G. fuer Bergbau, Salinen & Solbad-Betrieb, Unna-Koenigsborn	Coal, coke, salt.
(4) Georgs-Marien-Bergwerks-und Huettenverein, Osnabruck	Coal and ore mines, pig iron, steel products.
(5) Faconeisen-Walzwerk L. Mannstaedt & Cie. A.G., Troisdorf	Rolling mills, blast furnace products.
(6) Duesseldorfer Eisen u. Drahtindustrie, Dusseldorf	Wire products.
Interests in:	
(*a*) Crefelder Stahlwerk, Crefeld	Steel works.
(*b*) Geisweider Eisenwerke, Geisweide. (Interest shared with Thyssen)	Blast furnaces, coke ovens, open hearths, steel works, billets, thick, medium and thin plates.
(*c*) Maschinenbau-Anstalt Humboldt, Cologne-Kalk	Machines and parts.
(*d*) Isselburger Huette, Isselburg	Castings, machines, enameling.
(*e*) Kloeckner & Co., Duisburg	Trade in mining and smelting products.
(*f*) Maschinenfabrik Rheinland	Machines.
(*g*) Vereinigte Stahlwerke van der Zypen & Wissener Eisenhuetten A.G., Cologne-Deutz	Smelters and railway material.

It was decided in January, 1923, to form a fusion of the Lothringer Huetten & Bergwerksverein A.G., the Hasper Eisen und Stahlwerke, Haspe; the Koenigsborn A.G. fuer Bergbau, Salinen und Solbadbetrieb, the Georgs-Marien-Bergwerks-und Huettenverein A.G. the Duesseldorfer Eisen-und Drahtindustrie and the Faconeisenwalzwerk L. Mannstaedt & Cie. As the first-named company already possesses most of the shares of the other companies, its capital will only need to be increased from 125,000,000 marks to 150,000,000 marks to carry out the transaction. Extensions on a large scale are being planned in the neighborhood of Rauxel.

The annual production of the Kloeckner Group is as follows: Pig iron, 1,200,000 tons; Ingots, 800,000 tons; Coke, 800,000 tons; Coal, 3,300,000 tons.

Microscope Aids Steel Selection

Modern Metallurgy Employs Microscopic Examination Frequently with More Convincing Results than Chemical Examination—Application of This Method Is Finding Wide Use in Gear Production—Gear Development Reviewed

BY E. C. SMITH

USE OF the microscope in the study of metals is recent and its application broadens from year to year. Modern metallurgy uses the microscope as readily and steadily as chemical equipment, and often with much more direct and convincing results. It portrays the disposition of the constituents which is more important in the extreme, for example, by way of analyses: Two piles of material may be so arranged as to give a wall, in one case the material being so arranged as to be alternate brick and bricks of mortar. Such a wall would be useless, but from overall composition it would be correct. In the other case, the bricks may be imbedded in mortar, which is the correct arrangement. The ultimate composition is the same in both cases. Bringing the analogy to metals, chemical analysis does not show disposition, whether the structure is such as gives strength or other desired properties, or not. The grain, which may be likened to bricks, may be enveloped in a hard brittle mortar which is useless in ordinary practice.

The selection and preparation of a specimen has become an easy procedure, due to mechanical aids, and the rapidity with which information can be gathered, making the microscope an ever ready tool to the modern user of metals. Care and intelligence, however, must be brought in, otherwise totally wrong information is obtained.

The application of the microscope to the production of satisfactory gears in a satisfactory commercial way will be the subject of this discussion, and the treatment will be in chronological order, excluding the very early gears made of wood using wooden pegs as teeth. Examples of such may be seen working even today in Europe.

The earliest iron product must have been some material similar to our modern wrought iron. The methods of making both the primitive wrought irons and modern wrought irons were such that numerous particles of slag were included, which upon working, were elongated and which gave long thread-like particles. These were partly responsible for the fibrous break in this material. To the eye these appear as minute specks on the surface after polishing; to the miscroscope they appear as distinct patches like long threads. We do not, however, see any of the inner structure of the iron, just as we do not see the bricks and mortar in a brick wall covered over with cement, but if we pull off the cement the bricks and mortar will show up.

Specimens Are Etched

Now when we polish a specimen we cause the surface to be so broken up into microscopic particles that generally speaking we do not see any of the structure within the metal. If we immerse this polished surface in an etching solution we dissolve a small amount of the surface away which corresponds to the cement in the analogy just given, and since the chemical used dissolved the various parts at different rates, a pattern appears upon the surface. These various constituents have been studied and named following the plan somewhat used in naming mineral compounds. This is natural as the study is the outgrowth of the study of rocks to the study of metalliferous masses found in the earth as meteorites.

Fig. 1 shows a specimen of wrought iron which has been etched in a solution of picric acid and alcohol. The pattern developed in this specimen shows that not only slag is present but that a white constituent is divided up by a network and this makes up the ground mass. This white which appears as polygonal grains has been named ferrite and is, practically speaking, pure soft iron. There are black islands also and which upon higher magnification, show a duplex structure which has been called pearlite from its resemblance to mother of pearl. It has practically the same composition as tool steel, so we see that wrought iron is a mass of soft iron in which are slag threads and microscopic bits of tool steel. The inherent structure of wrought iron is such that it is unsatisfactory material to produce the uniform structure required in gears and it can be eliminated. It is too unreliable and if used, an enormous factor of safety would have to be included.

The next material that is available to inspection is cast iron, and this has advantages over wrought iron in that it can be cast easily and has greater reliability. Cast iron, however, has certain inherent structural conditions that make it a good or a poor gear material. The ordinary cast iron used for machinery when polished and etched, usually shows a three-part structure, as shown in Fig. 2. The light portion is the ferrite noted in wrought iron; the shaded portion is

From a paper presented at the Cleveland meeting of the American Gear Manufacturers' association, April 19-21. The author is chief metallurgist, Central Steel Co., Massillon, O.

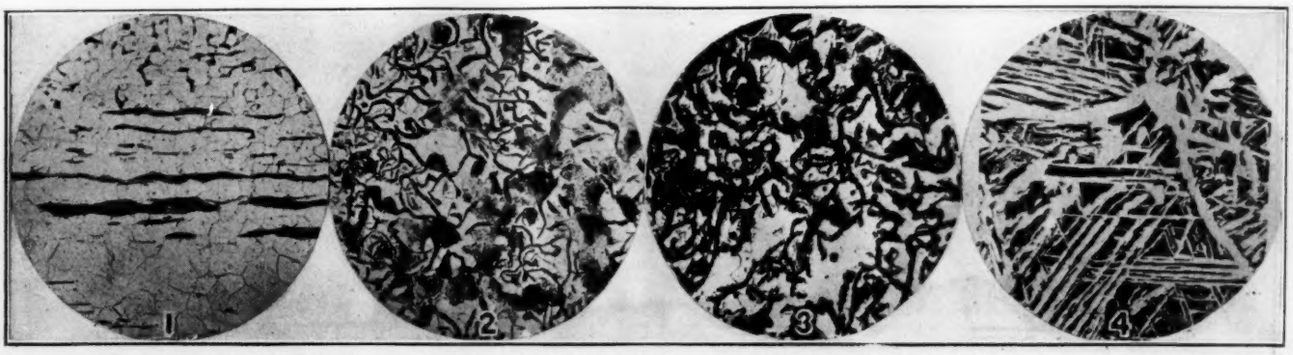


FIG. 1—WROUGHT IRON ETCHED TO SHOW SLAG INCLUSIONS. FIG. 2—POLISHED AND ETCHED CAST IRON SHOWING THREE-PART STRUCTURE. FIG. 3—CAST IRON RICH IN GRAPHITE AND FERRITE. FIG. 4—PATTERN OF MEDIUM CARBON STEEL CASTING

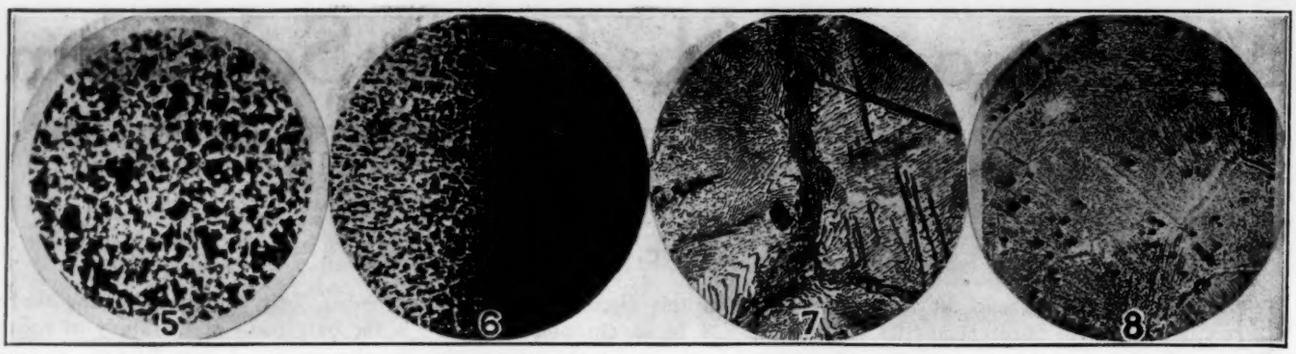


FIG. 5—STRUCTURE OF STEEL CASTING AFTER ANNEALING. FIG. 6—SECTION THROUGH A CASE HARDENED GEAR. FIG. 7—SLOWLY COOLED HIGH CARBON STEEL AT HIGH MAGNIFICATION. FIG. 8—CARBURIZED GEAR CONTAINING OVER 0.90 PER CENT CARBON

pearlite like small particles of tool steel, and the black curly structure which is in reality small holes from which a flake of graphite has been polished out. Thus we see that cast iron has a composite mixture. If too much graphite is present it has a poor structure; if too much ferrite is present it is too soft and if too much pearlite is present it may be too hard. The condition of the graphite is extremely important. Two irons having the same graphite content may be totally different as regards strength. If the flakes are small and do not interlock, the iron will be relatively strong; if large and interlocked, extremely weak. Fig. 3 shows cast iron rich in graphite and ferrite, therefore, is a soft weak iron and not suitable for gear work.

Another material used for certain types of gears with fine results is cast steel. The production of a nearly finished product with a single stage manufacturing operation has many desirable points. It also has a great advantage over the two preceding in that it is to a much less extent liable to be contaminated with objectionable constituents. The microscope can be and is used largely in the study of structure of cast steel gears and other materials. The structure revealed is one of the most vivid encountered in the study of metals and is used constantly as a primary specimen to demonstrate the powers of the microscope. An example is found in Fig. 4. The sharp black and white of a medium carbon steel casting is a pattern easily recognized since the peculiar design is the remains of the primary casting structure. In intensely heated iron or iron alloy objects, this structure develops until the needles are of such size that the eye needs no aid. The structure of a fragment of a meteorite would look like this.

When we anneal a steel casting the structure of the casting is destroyed and in its place comes a much finer grained structure than a casting in its original state. Its appearance is as shown in Fig. 5. The large plates of ferrite and pearlite are broken up into many small ones and the resulting casting improved considerably regarding strength of machining qualities, according to the immediate problem in view. The large plates of ferrite are liable to be planes of weakness and the liability to fracture is much greater. The big grains offer distinct planes of weakness

Should Develop Alloy Steel

Use of alloy steels as casting material is a field that should be developed more thoroughly. Improvement in product is pronounced. As the introduction of fabricated steel has reduced weight of steel in bridges, etc., which formerly were made of wrought iron, so the introduction of alloy steel has cut the weight of gears, etc., to 50 per cent of that previously required for the same load.

The type of gears covered so far has been that of gears produced from material by a one-stage operation. It has been noted that cast iron was inherently weak, the same applying to cast steel. Either and both usually are satisfactory material for ordinary gearing. The same applies to steel gears made from raw material, that is, untreated steel and untreated gears. A gear then is good or bad depending upon the source of material and the degree of care exercised in manufacturing. The function of a gear is to transmit power and as such it is an agent that must be under stress. In selecting material to undergo stress, due consideration must be given to the service encountered.

Early in the development of gears it was known that if the hardness of tool steel could be combined with the toughness of soft steel, the combination would produce hardness and toughness in the same piece. The ancient art of carburizing was called upon; this consisted in increasing the carbon content of the outside or case, and the case hardened gear was the development. The gear was thereafter machined and carburized and since the surface could be hardened without fear of breaking the piece, these gears were and are used with the surface in the hardened state.

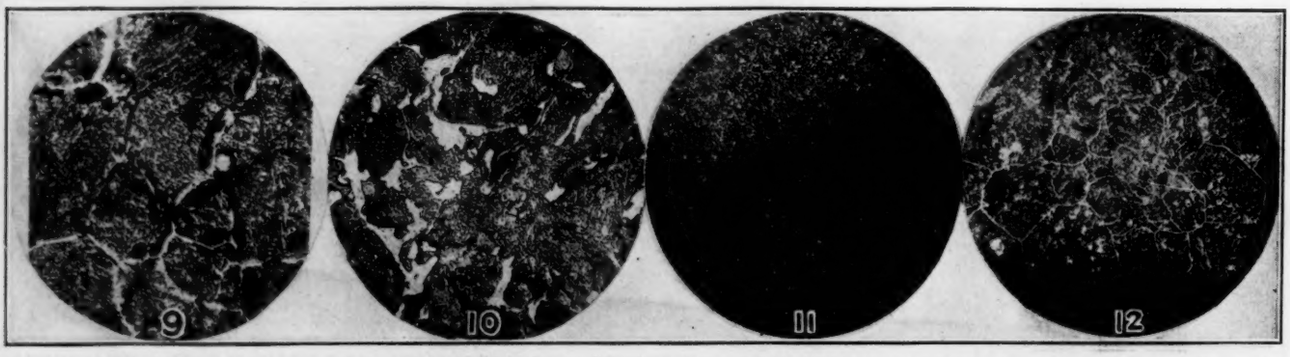


FIG. 9—TROOSTITE OR SOFT SPOTS ON CARBURIZED PART. FIG. 10—SORBITIC TYPE OF STEEL STRUCTURE. FIG. 11—CASE HARDENED PART WITH A REFINED CORE. FIG. 12—SPECIMEN WITH EVENLY DISTRIBUTED CEMENTITE BEFORE HEATING TO HARDEN

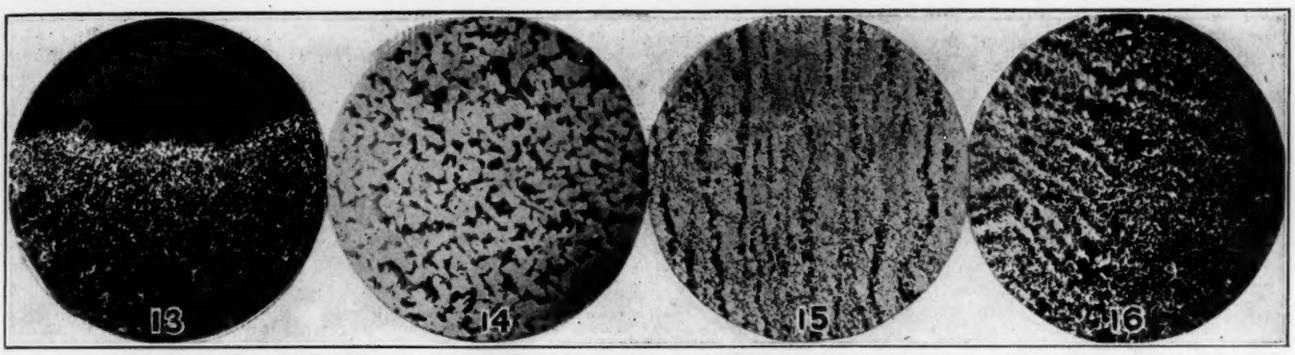


FIG. 13—CEMENTITE APPEARING IN SPECIMEN AS GLOBULES IS NOT DESIRABLE. FIG. 14—PEARLITE AFTER ANNEALING AT TEMPERATURE CORRESPONDING TO CARBURIZING HEAT. FIG. 15—ANOTHER SPECIMEN IN WHICH PEARLITE AREAS ARE STRINGY AND POORLY DEFINED. FIG. 16—AN EXAMPLE OF STRINGY STOCK WHICH HARDENED WITH DIFFICULTY

Fig. 6 shows a section through such a treated part. The darker portion is the skin of high-carbon stock covering the softer core material which latter is a mixture of pearlite and ferrite. The study of hardening these and other steel parts has developed into the modern heat treatment which plays such an important part in the present day use of steels. The microscope has played an important part in the analyses of conditions encountered and the explanation of many troublesome factors in treatment is due to the study by some metallurgical man with the microscope.

The constituents encountered in parts to be heat treated are not numerous. They may occur singly or mixed. At high magnification a piece of slowly cooled high-carbon steel would present the appearance shown in Fig. 7. This shows pearlite areas bounded by cementite, the fine wavy lines as well as the boundries are the extremely hard material known as cementite, containing nearly 7 per cent carbon. The light area is ferrite, thus pearlite is made up of a plate of ferrite and a plate of cementite, the grains being bounded by cementite showing that there was more cementite present than the normal pearlite could care for. This example shows a condition existing when more than 0.90 per cent is present. This condition exists in the outer edge of the case in the carburized gear and Fig. 7 could be used as an example of a highly magnified portion of the case.

Ferrite and Pearlite Merge

When we heat treat a piece of steel above a certain temperature the ferrite and pearlite merge into each other and we have a condition similar to dissolving sugar in water. We lose trace of the two part structure much as we lose the identity of the sugar in the syrup. If we had some means of instantly cooling the syrup we would be unable to determine by examination exactly where the sugar was. This condition is possible in steel by quenching rapidly. We can hold the structure in such a way that it is impossible to determine how much carbon is present, that is, we prevent its going into the stable condition. If this arrest is complete enough we have a material known as austenite which in plain carbon steels is not retained under ordinary conditions as the change takes place so rapidly that the ordinary quench is not severe enough. To attain this end, however, alloys are added which have a retarding action on this change. Under proper conditions the change can be prevented by ordinary methods of quenching. Because the austenite decomposes so rapidly we usually have a transition stage called martensite shown in Fig. 8. The hardness like the sweetness of the syrup, depends upon how much carbon is present; in other words, a syrup with much sugar is extremely sweet and in like manner martensite with much carbon, is extremely hard.

If the arrest is less complete, a black spangle appears in the field and the new constituent is known as troostite. Usually it is a product of quenching under conditions that are not of such intensity as would produce martensite. It first appears at the grain boundaries and reminds one of molds on fermenting jellies. The soft spot on the surface of a hardened carburized part usually is a troostitic one. It is distinctly softer than the martensitic surface directly around it and has been the source of worry to gear makers for years. A photomicrograph is shown in Fig. 9. Impurities have the effect of decreasing the intensity of a quench and under conditions whch should give martensite we have in the zone of such as it were an oasis of troostite commonly called a soft spot.

If the quenching is quite slow we have a fourth type of structure. It is uniform even under unusually high magnification, yet it has certain characteristics that make it resemble both troostite on the hard side and pearlite on the soft side. Referring to Fig.

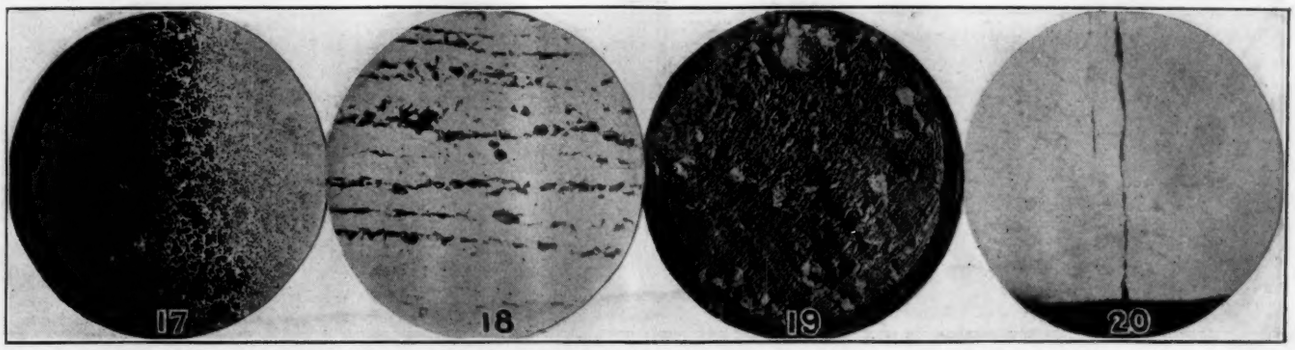


FIG. 17—SPECIMEN SHOWING SHARP LINE OF DEMARKATION BETWEEN CASE AND CORE. FIG. 18—A CORE WHICH SHOWS A DISTINCTLY BANDED STRUCTURE. FIG. 19—A SPECIMEN IN WHICH THE CASE IS TOO SHARPLY DEFINED. FIG. 20—UNETCHED SPECIMEN SHOWING A SLAG THREAD

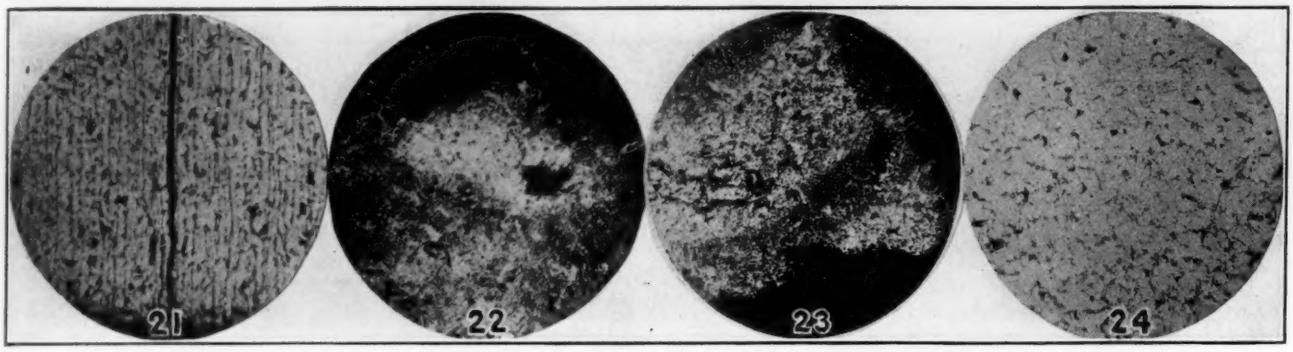


FIG. 21—SAME AS FIG. 20, ETCHED TO BRING OUT SLAG THREAD. FIG. 22—CROSS SECTION OF A DEFECT AFTER CARBURIZING. FIG. 23—A SURFACE SEAM IN CARBURIZED STOCK AFFECTS CARBON PENETRATION. FIG. 24—FOR MACHINEABILITY PEARLITE ISLANDS SHOULD BE WELL DISTRIBUTED AND SHARPLY DEFINED

10, the white is ferrite, and the dark, sorbite. Sorbite may be likened to oil beaten up in water, neither are seen but we now have a white liquid totally different from oil and water which compose it. In sorbite we have iron carbide in ferrite giving not an emulsion but a colloidal dispersion. It is possible for particles of one kind to get together and be so large as to be seen. In such cases white islands are seen, but in the photograph shown it is due to the solution not having been completed and these white islands were the undissolved particles of ferrite.

It has been said that the only way to make sure that a carburized part is good is to break it. That insures it not getting into production if wrong, but it is a rough thing on the dividends. This does not tell whether others in the batch similiarly treated are alike or not. Users of carburized steel have studied the steel, the carburizing conditions, the furnaces for quenching and every phase of the operations. In the study of manufacture of carburized stock, both before carburizing and on subsequent operations, the microscope is the most definite aid we know. Two reasons for the microscope aiding the carburizing man quickly and surely are: First, that the structures of carburized steels present considerable contrast and are easy to interpret; and second, that in the soft state before hardening, certain marked differences are present. It is difficult to analyze the conditions presented in a heat-treated specimen and, therefore, as much as possible must be made before treatment. It is known, however, from preliminary microscopic evidence obtained on a sample lot before quenching, that the lot of steel will give good or bad results with certainty. Soft spots can be predicted, exfoliation can be anticipated, brittleness in case of quenching, etc., all can be foretold and instead of the method of hit and miss, the whole can be scientifically controlled and lots of steel be diverted before rolling in the mills or before unloading at manufacturing plants.

How Carbon Penetrates

Modern American carburizing practice is to use rapid carburizers. Rapid carburizers tend to pile up high-carbon contents in the case. The study of the way the carbon penetrates and its distribution can explain many of the difficult problems of carburized gear work. Fig. 11 shows a case hardened part the core showing refinement. Let us suppose we have a specimen with something over 100 points of carbon in the case. This we know will show cementite in excess of that required for pearlite. It is a vital matter for the hardening room man to know the condition of the cementite. In heating to harden, we effect a physical change in that the cementite within the pearlite goes into solution first and then the cementite around the grain. If the distribution of the cementite is even and in a fine network, as in the Fig. 12, the solution will be rapid and uniform. If equal amounts of granulated sugar and loaf sugar are added to a glass of water, the granulated sugar will dissolve much quicker. The cementite in case can be compared to the sugar and the case proper as the water. When the cementite is coarse either more time or higher heat must be given to get it in solution. When a specimen occurs such as is shown in Fig. 13, with the cementite as globules, two obstacles are encountered. First, the solution of the cementite is slow and second, the distribution is far from uniform. Earlier in the paper it was stated that hardness of the martensite varied with the carbon content, other things being equal, and it is easy to understand that in a specimen in which the concentration of the carbon varies, the hardness must vary.

The total carbon present cannot measure the hardness possible to be obtained unless uniformly distributed and utilized. One gear may have enough carbon present to provide

FIG. 25—TOO LONG A PATH OF FREE FERRITE AND IRREGULAR PEARLITE ISLANDS HINDER MACHINING. FIG. 26—UNETCHED SPECIMEN TAKEN FROM BURNED GEAR. FIG. 27—SAME AS FIG. 26, ETCHED TO SHOW DECARBURIZED AREAS BEHIND BURNED SPOT. FIG. 28—A SOFT SURFACE PRODUCED BY OPEN FURNACE HEATING OF OIL HARDENING STOCK

a cementite envelope for each grain and another no excess of cementite and the gear with the excess may be a softer gear after hardening operations.

Some months ago a gear manufacturer said that prophets not historians were the more useful types of men. Most of us are historians and become prophets only by grace of the statement that history will repeat. If a given condition is found in a gear we may prophesy that it will occur again and if some method is available to predict its possible occurrence we should use it.

Establish Case and Core Relations

In the study of case conditions a definite relation has been established between case and core. The condition that affects the pearlite of the core is certain to affect the pearlite of the case. They are identical in physical composition and any condition that would tend to coarse globular cementite in the pearlitic areas of the core, must tend to coarse globular cementite in the case. Fig. 14 shows the pearlite after annealing at a temperature corresponding to a carburizing heat. The pearlite remains blocky and in sharply defined areas. Fig. 15 shows a similar specimen treated in same manner in which the pearlite areas are stringy and poorly defined.

Using our recent analogy, the blocky core structure should repeat its history in the case with blocky well distributed grains with uniform distribution of cementite giving a specimen which will harden uniformly and deeply from a low heat in a short time. The stringy core specimen should show a stringy gradation zone, as shown in Fig. 16, and a poorly defined case in which the cementite areas are globular and not in veins as shown in Fig. 12. This is an example of stringy stock, being taken from a carburized chrome nickel steel gear. This sample had sufficient carbon in the case to harden but would not harden even in water until heated for an excessive time and at an excessive temperature and quenched in cold water. This, of course, is an impossible condition due to the resulting warpage which arises. With high heat, an additional evil presents itself; decarburization of the case with attendent soft case on quenching. When the globular condition of the pearlite in the core is pronounced it would be expected that some pronounced defect would show up in carburizing.

Fig. 17 shows a sharp line of demarcation between case and core, which are not knit together. There is no binding and this type of case would tend to spall or flake off. A case of this kind is particularly dangerous in ground gears or other carburized parts. A somewhat similar condition may be encountered when the core shows the distinctly banded structure shown in Fig. 18. If the laminations have been caused by small particles of inclusions along the bands, the penetration slows down and the carbon tends to pile up behind the band producing a sharp zone.

When the case is too sharply defined, the carburized piece is dangerous and liable to cause trouble in service. Usually it is more brittle than the proper case, more sensitive to faults on design and, in general, is a trouble maker. Fig. 19 shows such an example. This specimen is a fracture of a rather sharply defined case. It is also of interest on account of showing traces of defects in the bar stock, which may be a small slag inclusion or possibly a blowhole trace left from the ingot. Looking at a longitudinal specimen of a similar defect we see a coarse woody structure with certain well defined lines appearing as shown in Fig. 29. This structure is pronounced in certain types of steel, mainly nickel. It is the cause of considerable loss in the manufacture of carburized ring gears and pinions in the automotive industry. It is also the main source of weakness in the type of gear cut from bar stock with teeth running parallel to the length of the bar. Under the microscope these lines appear as a slag thread and when etched show a well defined parting line that divides the structure completely. Figs. 20 and 21 show unetched and etched specimens, respectively.

Examining Fig. 22, the cross section of a similar defect after carburizing, we note that for an area around the slag particle, the penetration has been altered and since the distribution of the carbon is not uniform, we must expect variation in hardness in the finished work. This and similar defects explain in a way the small soft spots in the middle of a file hard gear tooth or surface of a bearing which were touched upon earlier.

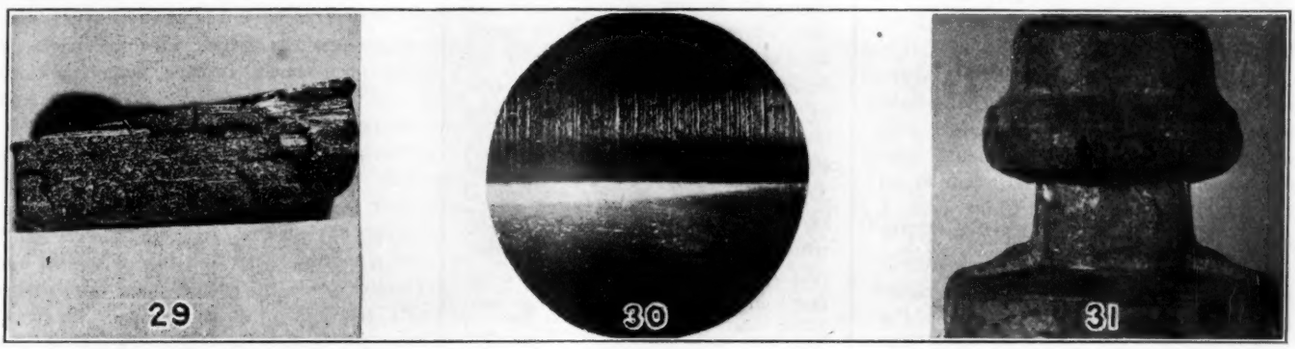


FIG. 29—LONGITUDINAL SPECIMEN OF A SLAG INCLUSION OR BLOW HOLE SHOWING COARSE WOODY STRUCTURE WITH WELL DEFINED LINES. FIG. 30—ROUGH MACHINING MAKES SMALL V-NOTCHES IN BAR AS SHOWN BY PORTION POLISHED AWAY. FIG. 31—AN EXAMPLE OF BURNING IN WHICH CASE THE FORGING USUALLY IS SCRAPPED

Lay Stress on Surface Defects

In the preparation of alloy steel for manufacture into gears and similar products, a great deal of stress is placed upon the complete removal of surface defects. There have been cases where steel suppliers have been inclined to think that the user was over critical and that small defects might be tolerated. The usual point made is that if the defect machines or grinds out the piece will be satisfactory. In a great many cases this is true but in many cases it is only partially true. Fig. 23 shows a surface seam in a piece of carburized stock and the effect of this defect upon the carbon penetration. The effect of the oxide in the seam is to cause the penetration to be poor and uneven. This defect in an oil hardening gear is doubly serious as in addition to being a mechanical defect,

(*Continued on Page* 679)

China a Market for Steel Scrap

Nearly All Agricultural Implements and Workmen's Tools are Made from Forged Scrap Steel—Approximately 50 Per Cent of All Imported Steel Is Selected Old Material—America Supplies Small Share

AMERICAN steelmakers generally never have paid much attention to the great ability of China to absorb crop ends and other defective tonnage. Some interests which have investigated the possibilities for shipping such material to China instead of remelting it in their open-hearth furnaces have felt that the prices obtainable are not attractive in view of the cost of labor involved in making assortments of sizes in accordance with the Chinese customs. They have felt that European steelmakers were more favorably situated with respect to labor costs and, therefore, have thought it advisable to continue to leave the bulk of this business to Europe. Too, other factors have been found objectionable.

"The inclination of the Oriental buyer to set up claims on account of slight variations from specifications, either real or imagined," says one individual who has given a great deal of attention to the steel requirements of China over a period of a good many years, "makes it very unsatisfactory to attempt to supply his requirements of scrap. Such variations are more readily avoided by the manufacturer when supplying new materials. Month after month, so long as market conditions are favorable to him, the buyer makes no complaint, but as soon as there is a change in those conditions which would lead him to desire to reject the cargo, claims on account of rust, gage, dimensions, quality, packing, etc., begin to pour in or the cargo may be refused entirely."

Says Field Is Profitable

That American steelmakers as a result of this attitude are constantly losing a considerable amount of Chinese business which would yield them a profit, is the opinion of G. T. Armstrong, who recently opened an office at 80 Maiden Lane, New York, for the sole purpose of buying mill scrap for export to China. Mr. Armstrong admits that the viewpoint of the mills is not unfounded. He claims, however, that the amount of labor necessary to sort scrap for the Chinese trade is not as great as supposed and that if the proper kind of scrap is shipped most of the sorting can be done in China where labor is cheap. Too, where the seller deals directly with houses in China who understand conditions and who are accustomed to doing business with the Chinese buyers and have their confidence, Mr. Armstrong says that many of the difficulties alluded to above are avoided.

"For many years to come," says Mr. Armstrong, "scrap will continue to be the popular semifinished material with the great majority of Chinese workers. "In that country," he says, "the larger percentage of the hand tools, steel household implements and steel agricultural implements are hand-forged from scrap. Therefore, scrap is divided into a great many classifications according to its dimensions and shape, and the quotations on these classifications are reported regularly by the different metal guilds of China along with the quotations on prime materials such as pig iron and new steel. At the present time, Europe largely is the source of this scrap, despite the fact that American steel is regarded by Chinese consumers as of superior quality. It is only in wire shorts that the American mills regularly use China as a scrap outlet. Mr. Armstrong believes that it would prove both feasible and profitable for the mills to ship to China much of their output of defective bars, plates, wire rods and other products which now go back to the open-hearth furnace for remelting.

"A few days ago," said Mr. Armstrong, "I offered to buy a considerable tonnage of defective wire rods from a mill at $23 a ton, which was $5 above their scrap value. The mill declined the order saying that its rollers were paid on a tonnage basis and that if it sold defective rods it would have to revise its schedule in order to give the men an allowance for these rejects. The mill offered to consider the proposition provided I would agree to take its entire output of defective rods, but this I was unable to do. It would take some time before our Chinese representatives could insure distribution of the entire output. But it distinctly would be worth while for the mills to get this Chinese business started. It is certain that the ultimate result would be a large and steady Chinese distribution not only of defective rods but all kinds of mill seconds. Thus a large amount of scrap which now is remelted would share in the mill overhead.

Use Primitive Implements

The fact that China has a population of 410,000,000 people and yet has only 5000 miles of railroad, said Mr. Armstrong, is fairly indicative of the state of progress as a whole. In the average household, practically the only steel kitchen utensil is a steel cleaver, which is hand forged from scrap. There are no steel pans in the kitchen; food is cut up with the cleaver and is placed in a large cast iron bowl, on a clay stove, to boil. Otherwise, the only steel implement in the average home is a pair of scissors, hand forged from bamboo steel.

United States Could Sell Material

PRACTICALLY all small forgings manufactured in China today are made from steel scrap. Therefore, assorted scrap is in demand and commands attractive prices. A steel cleaver and pair of scissors are the only implements in the average Chinese home, while a digging fork, sickle and hoe are the customary steel tools used on the farm. Chinese workmen have few tools and these include a hammer, saw, chisels and a bit. Much of this equipment is made at small hand forges and from imported selected steel scrap. About 50 per cent of the steel imported into China is steel scrap and with the exception of wire shorts from the United States, the bulk of this material is supplied by Europe. In this article, which surveys the scrap consumption of China, the author points out that mill ends and defective material produced in America could be exported to the Far East at price levels considerably above that charged to the remelting of scrap. The main objection to this business always has been that because of the high price which must be paid American labor for sorting this material, no profit could be made. The author proposes that with the shipping of the proper kind of scrap, the final sorting could be done in China where labor is cheap. But more important, before satisfactory business can be done, it is necessary to have a knowledge of Chinese customs and requirements and to have a representative to deal directly with Chinese buyers.

"Chinese workmen have few tools," said Mr. Armstrong. "The carpenter has a hammer made of an old horseshoe, with a handle made from a steel bar. He has a small saw which is fitted into a frame like a buck-saw, which is used both for scroll work and ordinary sawing. He has two or three wood chisels made of bamboo steel. He has a bit which he works with a fiddle-bow. The carpenter gets 40 to 50 cents a day in Shanghai and other treaty ports and 25 to 30 cents in the interior.

"Probably 50 per cent of the land turned in China is turned with a digging fork made from scrap plate cuttings. This fork has the tines turned down like our potato fork and has a 6-foot handle. The farmer holds the fork out straight before him and lets it drop. The weight of the fork causes the tines to penetrate the soil and the farmer pulls the fork toward him, thus turning the soil. The farmer has a hand sickle made of bamboo steel and a hoe made from plate cuttings. That completes the average farming equipment as far as steel tools are concerned. Rice paddies usually are plowed, while covered with water, by a plain forked stick pulled by a water buffalo. Practically no ploughshares are used in China.

Makes Tools at Home

"These primitive tools are made by similarly primitive methods, by individuals who buy raw material and convert it into finished tools right in their homes. These mechanics have hand-forges with box bellows worked by an apprentice boy. Each of them has an anvil, two or three sledges which either have been imported or are home-made from scrap, and he generally has about a dozen imported files with which to finish the surface of his product. These tools comprise the average equipment for manufacturing such steel tools as suffice by far the greater proportion of the population of China.

"For supplying these individual forging establishments, the raw material usually is scrap. The hand forgers buy new material only when it is impossible to secure sufficient scrap. For this reason scrap constitutes substantially 50 per cent of the steel imports in China. The Chinese railroad buys new steel and so do the mines and foreign shipyards as well as some other plants. Recently, for instance, plants have been established at Canton, Shanghai and Hangkow where new material is made into bolts and where imported blank nuts are threaded. But the great majority of users depend on scrap.

"One of the scrap staples comprises bar crops, graded according to size and weight," said Mr. Armstrong. "It is true of bar crops and pitted and rusted bars, as well as all other scrap that they must be of soft carbon steel, for the Chinese workers are not accustomed to working with alloy steels. Another stable classification is plate cuttings which also are graded to size, the most popular specifications being from 1½ to 3 inches wide and 12 to 20 inches long and ¼ to ⅝ inch thick. Cobbled bars are a popular form of scrap and are graded as Antwerp and English cobbles. They may come from Belgium, or anywhere else, but soft cobbles are always Antwerp cobbles and hard cobbles are English cobbles. Old horseshoes are prized for certain purposes and are graded, according to size and weight, as Antwerp, Liverpool, Glasgow, American city and American country. Old wagon tires are graded as London, Glasgow and American. Defective wire rods have the same classifications and command the same prices as cobbles.

"Among the most popular selling grades are soft galvanized wire shorts, being graded as American, English and German. These wire shorts usually are shipped from the United States in catch-weight coils, unassorted as to gage. With the low cost of labor, the Chinese can assort and tie the scrap into bundles and the resultant product brings a price about 15 per cent less than prime material. Annealed wire shorts are graded the same as galvanized wire. Old telegraph wire has a high market value. Old files are a staple. Tin plate waste wasters and cold-rolled cobbles and black sheet and galvanized cutdowns and seconds all are staple grades in China. In fact, the Chinese will buy any defective, misrolled or off gage material which can be had at a lower price than primes and which is small enough to be forged by hand.

"Old dismantled ship plates have a value in China equivalent to about $17.50 per gross ton f.a.s. Atlantic or Gulf ports, provided the rivets have been knocked out and not burned out. This is because the burned edges cannot be worked and must be trimmed off, and hence the burned plates are not desired."

Europe Has Bulk of Trade

The bulk of the trade in wire shorts, said Mr. Armstrong, is supplied from the United States, where the mills take this business seriously. But in all of the other materials, the great source of supply is Europe. To some extent this is because of the fact that American prices do not compete with the European prices on similar material. But the principal reason is that the business here is not organized. At the present time the mills generally either remelt their scrap or they sell it to scrap dealers. The latter generally want considerably more per ton for the scrap when it is sold for export or any purposes other than remelting. Mr. Armstrong believes that if the mills take the Chinese business seriously, they can obtain well above the scrap value of their rejected and defective material.

Selling scrap steel in China proved a discouraging business to many American companies during the past few years, said Mr. Armstrong. Much American steel was sold in China at high prices. In a great many cases material other than specified was shipped to the Chinese. In a good many cases they retaliated when the market began to go down by rejecting scrap on technicalities, and it was said that they made more money out of unjust claims than they made in their business. To do a satisfactory business with the Chinese, said Mr. Armstrong, it is necessary to have a fundamental knowledge of their customs and their requirements and to have someone on the ground who can deal with the Chinese buyers directly. Mr. Armstrong spent eight years in China, part of the time as assistant manager of Getz Bros. & Co., Shanghai, and for two years as manager of the metals department of Anderson, Meyer & Co., Shanghai. He now is represented in China by a Chinese firm.

Microscope Is an Aid in Steel Selection

(*Continued from Page 677*)

it also acts as a channel along which oxygen passes and decarburizes the sides of the defect. This is progressive and from a small crack a large area soon is made from low carbon. In the subsequent machining or grinding operations the defect may be removed and yet below the surface there may remain a disturbed area that is soft and probably will continue soft on later treatments.

In isolated cases of carburized or oil treated work small cracks often are found for which no reasonable explanation can be made. In handling an example of this type the microscope furnished the solution of the problem. The job was carburized round with a ground finish similar to the bearing end of a transmission spline shaft. All study of carburizing and grinding failed to locate the reason. The crack was shallow and since the stock was double treated in water, broke through the case in certain instances. Since the crack was located after the finishing grind the trace of machine work was gone.

In locating the defect a large number of the rough machined pieces were partially ground after carburizing and hardening to follow up a

surmise that the depth of tool marks might furnish a reason. After inspecting, one was found which had cracked directly coinciding with a tool mark and this was then polished and placed under the microscope where it was determined that sharp bottomed tool marks were the source of trouble. In other words, the sample was being subjected to a "V" notch condition, the stresses were being localized at the base of "V" and reached a critical value. Fig. 30 shows such a defect; the rough machining is seen to make small "V" shaped notches into the interior as shown by the portion polished away.

The next and more important phase was to determine why certain bars gave a rough finish when the majority would machine smoothly. Since the cracked rounds had been double quenched it was useless to attempt to study the original bars from the finished stock so the study was made on samples which gave rough and smooth finish, using some of the fresh stock. Examination showed that in every case where the finish was rough, the pearlite in the stock was broken down to give a globular condition. When the pearlite resisted breakdown the finish was better and the hardness of the finished product was much better, for example, under the microscope the pearlite islands should be well distributed and sharply defined. They should not be irregular in condition or distribution as then the tool has too long a path of free ferrite which is not easily cut and dragging results. Examples of this are shown in Figs. 24 and 25.

A similar defect could have been produced by poor tool conditions or poor design. In the case of some driving pinions the tooling operation left a pronounced mark at the base of the tooth. The corner was unusually sharp and the resulting product was ready to snap under slight stress. The cracks started from the base of this tool mark and quickly worked through the core.

In handling of oil hardened steels the miscroscope is not quite so efficient as in carburizing steels but its advantages are noticeable.

One of the most insistent defects that is encountered is burning. In an exceptional case as in Fig. 31, the burning is plainly visible and the forging is scrapped if the inspection is efficient. If, however, the burning is slight and a gear is made from this forging, the surface of the teeth may appear normal to the eye, but the resulting gear is poor and apt to break.

When a section is cut from such a gear in the unetched stage it shows the cracks extending into the body and behind the cracks and shows the grains bounded by oxide as in Fig. 26. After etching we see the effect of the burning in the decarburized areas behind the burned spot, as shown in Fig. 27. Such a gear may machine to a perfect surface but have soft spots after hardening.

A similar condition can be produced in open furnace heating of oil hardening stock as given in Fig. 28. In this case the surface is usually soft all over. The microsection shows the low carbon zone. A similar condition is encountered when heating in fusible salt mixtures unless sufficient carburizer as cyanide chloride is added to counteract this effect.

That the microscope is used daily in solving problems is well exemplified by the series of micro standards established by a gear manufacturer to explain his difficulties. The work of establishing standards is progressing and at some future date we may pay as much attention to structure as we do to chemical analyses.

Artistic Castings Made in American Sand

IN PROOF of his contention that artistic castings can be made in local sand equal to those produced in special sand or even in sand imported from France, W. F. Uschmann, Nashville, Tenn., prepared the various castings, shown in the accompanying illustration with a view of exhibiting them at the recent convention in Cleveland of the American Foundrymen's association. The castings are made from a special white metal alloy employed for many years as an alloy for patterns on account of its non-shrinkable qualities. Attention is directed to the fact that the castings required no chipping or grinding after they were taken out of the sand The only cleaning they received was from a soft wire hand brush. It is stated that the metal takes a beautiful finish and may be plated and finished as highly as Britannia metal or silverware. The casting with the letter P is a good example of how sharply small details like the radial lines have been reproduced. The casting in the center was made by employing a piece of lace paper for a pattern and the small casting representing a lady is only 1/32-inch thick.

INTERESTING EXAMPLES OF SMALL BRASS AND WHITE METAL CASTINGS MADE IN LOCAL SAND

News of Societies

Past and Coming Meetings of National and Local Trade and Technical Organizations

PLANS are announced for the iron and steel exposition to be held in conjunction with the convention of the Association of Iron and Steel Electrical Engineers at Buffalo, Sept. 24-28. A quantity of special apparatus will be on display, representing the industrial developments of the largest manufactures during the past year.

The technical sessions, to be held at the convention of the Association of Iron and Steel Electrical Engineers have been prepared with the view of imparting the practical experiences and data obtained by engineers in the field of operation. The program for the technical sessions is as follows:

Monday, Sept. 24

930 a. m.—Business session, Hotel Statler.
2:00 p. m.—Grand opening Iron and Steel exposition.
2:30 p. m.—Report electrical development committee, by Walter Kennedy, chairman. Report of safety committee. "Specifications Covering Automatic Engine Stops," by Walter Greenwood, chairman. Report of standardization committee, by F. W. Cramer, chairman.

Tuesday, Sept. 25

9:30 a. m.—Report of special bearings committee, by D. M. Petty, chairman. "Motor Operated Centrifugal Pumps in Steel Plants," by B. A. Cornwell.
2:30 p. m.—"Single Bucket Blast Furnace Skip Hoist Characteristics," by A. R. Leavitt and A. C. Cummins. "A System of Coal and Ore Bridge Traverse, Control for Protection Against Wind and Skewage Hazards of Skews Type Direct Current Bridges," by P. R. Canney.

Wednesday, Sept. 26

9:30 a. m.—"The Complete Electrification of the foundry Industry," by L. W. Egan.
2:30 p. m.—"Electric Furnace Phenomena," by E. T. Moore. "Liquid Slip Regulator or Rheostat," by D. M. Petty.

Thursday, Sept. 27

9:30 a. m.—"Economical Use of Fuel in the Steel Plants," by H. C. Siebert. "The Tempering of Coal," by Thomas A. Marsh.
2:30 p. m.—"High Pressure Steam Boilers," by D. S. Jacobus. "Boiler Troubles from the Operating Man's standpoint," by Carl J. Smith. "Surface Combustion and Its Application," by W. N. Hepburn.
7:00 p. m.—Banquet, ball room, New Hotel Statler.

Friday, Sept. 28

9:30 a. m.—"Systematizing the Work of an Electrical Engineering Division," by P. T. Vanderwaart. "Electric Transportation," by F. O. Schnure.

* * *

Spring Meeting Announced

The forty-fifth meeting of the American Electrochemical society will be held in Philadelphia, April 24-26, 1924. The limiting date for the acceptance of papers for this meeting is Feb. 15.

* * *

Select Convention Dates

Executive committee of the Society of Automotive Engineers has selected Jan. 22 to 25, the week of the annual automobile show in this city, as the time for the holding of the annual convention of the organization here.

Convention Calendar

Sept. 10-14—American Chemical society. Fall meeting, Milwaukee. L. Parsons, P. O. box 1515, Washington, is secretary.

Sept. 17—American Ceramic society. Fall meeting, Grand Central Palace, New York. R. C. Purdy, Ohio State university, Columbus, O., is secretary.

Sept. 17-22—Chemical Industries. National exposition, Grand Central Palace, New York.

Sept. 24-28—American Association of Iron and Steel Electrical Engineers. Convention and exhibition, Auditorium, Buffalo. Headquarters of the association are located at 1007 Empire building, Pittsburgh.

Sept. 27-29—American Electrochemical society. Annual meeting at Dayton, O. Dr. Colin G. Fink, Columbia university, New York, is secretary.

Oct 1—National Safety council. Convention and exhibition, Hotel Statler, Buffalo. W. H. Cameron, 168 North Michigan avenue, Chicago, is secretary.

Oct. 8-12—American Society for Steel Treating. Annual convention at Pittsburgh, W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

Oct. 24-26—National Association of Farm Equipment Manufacturers. Annual Meeting at Cleveland.

Obituaries

JAMES A. BECKETT, Troy, N. Y., assistant engineer for the American Malleable Castings association, and acting field representative for that organization, died Wednesday, Aug. 22. Mr. Beckett was born in the north of Ireland in 1855 and came to this country at an early age. Shortly after his arrival he secured employment in the gray iron foundry of the W. A. Wood Mowing & Reaping Machine Co., Hoosick Falls, N. Y., where he began as a molder. He subsequently was made assistant foreman of the gray iron foundry, then foreman, and in 1895 he was appointed to be general manager of the plant, occupying that position until about 1910 when he resigned. He did not resume active duties until the beginning of the war when he became production engineer attached to the Rochester division of the ordnance office with headquarters at the Lackawanna Steel Co., Buffalo. After the war he became associated with the American Malleable Castings association co-operating with its engineering office in Albany, N. Y., in the position he held at his death. Mr. Beckett was a member of the American Society for Testing Materials.

John E. Snyder, who founded the business of John E. Synder & Son, Worcester, Mass., builders of sensitive drills, 41 years ago, died unexpectedly from heart disease in his camp in Nova Scotia, Aug. 25 at the age of 73 years. He had been in camp with his wife and daughter less than a week and was in excellent health when he left home. Mr. Snyder was a member of the National Machine Tool Builders association and rarely missed attending its conventions. His son, Milton C. Snyder, will continue the business.

Charles P. Russell, who retired as president in 1912 of the Wiley & Russell Mfg. Co., now a division of the Greenfield Tap & Die Corp., Greenfield, Mass., and of which he was one of the founders, died at his home in that town, Aug. 27, aged 83 years. He was one of the pioneers of the industry and the inventor of the screw plate method of making taps and dies, an improvement that revolutioned the industry.

Parker Shackleton, 15 years ago president of the Ohio Roofing Co., a sheet metal concern, died at his home in New Rochelle, N. Y., Aug. 31, at the age of 77. Mr. Shackleton came to Cleveland from England and was a cousin of Sir Ernest Shackleton, the famous polar explorer.

Cuba Buys More Steel

Washington, Sept. 4.—Cuba took second place as a purchaser of American iron and steel in June, outstripping Japan which held that place in the previous month. Canada as usual was far ahead of all other importers of United States iron and steel in both months. Following are those countries to which were shipped more than 1000 tons of iron and steel products by American manufacturers in June.

Countries of destination	May	June
Canada	78,012	68,774
Cuba	18,128	20,712
Japan	44,806	18,127
Argentina	7,045	7,430
Mexico	9,012	6,386
United Kingdom	5,971	6,173
Kwantung	2,975	6,172
Brazil	3,089	4,579
Philippine Islands	1,507	3,795
China	5,234	3,629
Australia	1,849	3,100
Colombia	2,142	2,396
British South Africa	1,068	2,218
Peru	1,301	2,318
Dominican Republic	367	1,760
Chile	4,671	1,659
Hongkong	817	1,528
Spain	397	1,098

New England Malleable Iron Plants Merge

The Arcade Malleable Iron Co. division of the Baldwin Chain & Mfg. Co., Worcester, Mass., and the Springfield Malleable Iron Co., Springfield, Mass., owned by the same interests, are to be consolidated in a new company under the name of the Arcade Malleable Iron Co., with headquarters in Worcester.

The Baldwin Chain & Mfg. Co. will sell the foundry end of its business to the new company, which will have a capital of $550,000 in first mortgage 7 per cent gold bonds, $500,000 in 8 per cent cumulative preferred stock, and 10,000 shares of common stock without par value.

Henry P. Blumenauer, vice president of the Baldwin Chain & Mfg. Co., and general manager of both subsidiaries, will be president of the new company, retaining the former position. Among the directors of the new company will be Frank J. Weschler, president of the Hendee Mfg. Co., and John N. Collins, vice president of the Moore Drop Forging Co., both of Springfield, and J. Verner Critchey, president of the Reed-Prentice Co., Worcester.

July Output of Malleable Castings Drop

Washington, Sept. 4.—July production of malleable castings, manufactured for sale as such totaled 57,881 tons as compared to 65,168 tons in June, according to figures of the department of commerce. The 103 plants in operation during the month worked at 58.9 per cent of capacity as compared with the 100 plants working in June at 67.7 per cent of capacity. The figures for June in the following table are revised to include reports received subsequent to the preliminary figures issued for that month by the bureau of census.

	Total tons produced	Per cent of capacity	Total tons booked	Monthly capacity
May	64,726	71	52,898	91,174
June	65,168	67.7	42,067	96,240
July	57,881	59.9	41,723	98,241

On the basis of operations of 88 identical establishments the orders booked totaled 50,470 tons in May, 36,240 tons in June and 36,252 tons in July while the per cent of capacity at which these plants operated was 71.0 in May, 66.9 in June and 57.2 in July.

Defaults Bond Interest

London, Aug. 24.—Workman, Clark & Co., Ltd., have defaulted on the interest on their bonds. This company is one of the largest shipbuilding companies in the United Kingdom, with yards at Belfast, Ireland. The company is capitalized at £1,080,000 ($5,000,000) in common stock and £3,000,000 ($13,750,000) in bonds. It is the interest on the latter, at 7 per cent, which is not being paid. Considerable feeling has been aroused because this company is owned by the Northumberland Shipbuilding Co., which guaranteed the interest on the Workman-Clark bonds.

Swedish Machine Tool Industry Improves

Improvement in the mechanical industries in Sweden was maintained during the first months of 1923 and even showed a more rapid increase than in 1922 according to the Swedish Economic Review. Machine shop industries were not involved in great labor disputes and work was carried on without a collective agreement for the entire year. On March 10, however, new compact was made in the machine shop making the average wages for 1922 guaranteed until the close of 1923. The reduction of 10 per cent that was scheduled to take place in February was cancelled. The present average of wages may be figures at 45 per cent below the maximum wage of 1920.

The increase in production was greater than the increase in labor power would indicate. The number of fully improved works in the various groups is shown in the accompanying table.

Date	Machine shops	Electrical industry	Shipyards	Total
1920 Sept. 1.	41,600	7,500	10,900	60,000
1921 July 1..	21,500	5,000	5,900	32,400
1922 Jan 1..	18,900	4,000	4,100	27,000
April 1.	17,600	3,600	4,000	25,200
July 11.	18,700	3,700	4,000	26,400
Oct. 1.	18,400	4,200	3,700	26,400
1923 Jan. 1..	19,900	4,400	3,900	28,200
April 1.	22,400	4,400	4,400	31,200

The elimination of competition from the Ruhr has contributed considerably to the improvement in the situation although certain orders have been held up as the result of cancelling of deliveries from Germany. Orders are unequally distributed among the various products manufactured. The greatest demand at present is for motors and paper making machines and after these for mining machines and pressed steel parts.

Take Bids on Cranes

Washington, Sept. 4.—At the Chicago Philadelphia and New York district offices of the bureau of foreign and domestic commerce are specifications for the construction and erection of four electric coal-unloading cranes of 7-ton capacity each, for the South Australian Harbors board, Adelaide, South Australia. Bids will be received up to Oct. 30, the department of commerce states.

Appoint American Agent for British Company

The American representation of Naylor, Benzon & Co. Ltd., London, has been placed in the hands of Rogers, Brown & Co., New York, according to an announcement by Naylor & Co., New York, hitherto agents in this country for the London house. Through their branch offices, Rogers, Brown & Co. will handle all sales in this country of iron ore, pyrites, pig iron, metals, etc. for this well-known English house, which is an important factor in the ore and metals trades throughout the United Kingdom and the Continent of Europe, enjoying close relations with the iron and steel producing interests of all the European countries. G. F. Murray, president of Naylor & Co. and for many years associated with that interest, will be connected with the foreign department of Rogers, Brown & Co., thus preserving the continuity of relations with the London house.

Naylor & Co. is one of the oldest concerns in the American iron and steel industry. The exact date of their formation is not known but the company dates back prior to 1800. Originally it engaged in the iron and steel importing and warehousing business with headquarters in Boston. Later it extended its branches to other principal eastern cities. The company has always been affiliated with British interests. For many years, and particularly during the last half of the nineteenth century, Naylor & Co. were one of the largest importers of iron and steel products and lately have been prominent in steel exports. Due to the extent to which the American iron and steel industry became self sustaining in late years the business of the company has decreased. In fact, during the past 30 years most of the business has been the importation of ores, particularly iron and pyrites. The pyrites business fell off during the war owing principally to the difficulty of ocean transportation and has never wholly revived because of the fact that pyrites has been largely displaced by sulphur from the Gulf producing district. Prior to the war Naylor & Co. obtained the American agency of the German ferromanganese syndicate, which arrangement was renewed after the war, but while several thousand tons of German ferro have been sold since the armistice, the situation in the Ruhr has prevented a continuance of the business.

James Allen, founder, Adams, Mass., has sold his property on Dean street in that town to the Gagner Mfg. Co. and moved across the street to another building recently acquired.

Orders Increase

For Refractories—Operations Continue Between 70 and 80 Per Cent

Pittsburgh, Sept. 4.—More numerous orders for refractories have been the experience of a number of sellers in this district the past week or so, as compared with the few weeks previous. Each of these orders, however, has been for a relatively small amount of brick, typical orders running from a single carload up to 100,000 brick at a time, although occasionally a lining for a blast furnace has figured in the orders which have been received.

Activity mainly has revolved about repair requirements of various consumers, there being little or no new construction current at the moment. Prior to this miscellaneous buying movement, users apparently were concentrating on the cleaning up of their shed stocks, and continuing their present policy of buying on a hand-to-mouth basis they are not stock. In some cases the brick is taken making much of an effort to replenish the from the railroad car direct to the repair work under way.

So far as can be observed, the price reduction of $3 noted two weeks ago failed to stimulate much interest in fire clay brick, and the $45 to $48 spread still applies on the No. 1 Pennsylvania grade. Pennsylvania silica is unchanged at $45 although one or two brands still are bringing $47. The Birmingham silica brick price did not decline and remains at $53. Operations of silica and fire-clay brick plants continue to average between 70 and 80 per cent, some attaining and maintaining 85 per cent of capacity.

The buying movement in connection with chrome brick lately has been comparatively large, several orders from 5500 to 50,000 brick at a time having been closed up within the past two weeks. One company in the Wheeling district having brought 50,000 closed on an additional 24,000. Lately single carloads have prevailed and the price in each case has been unchanged at $50 per net ton. Spasmodic interest in magnesite brick too is encountered at the $65 seaboard base figure.

Refractories

FIRE CLAY BRICK
(Per 1000 f.o.b. works)

Pennsylvania, No. 1	$45.00 to 48.00
Pennsylvania, No. 2	43.00 to 46.00
Ohio, No. 1	45.00 to 47.00
Ohio, No. 2	40.00 to 43.00
Illinois, No. 1	48.00 to 50.00
Illinois, No. 2	45.00 to 47.00
Kentucky, No. 1	45.00 to 47.00
Kentucky, No. 2	40.00 to 42.00
Missouri, No. 1	43.00 to 45.00
Missouri high grade	48.00 to 53.00
Maryland, No. 1	48.00 to 51.00
Maryland, No. 2	42.00 to 45.00

SILICA BRICK

Pennsylvania	45.00
Chicago	52.00 to 54.00
Birmingham	53.00

MAGNESITE BRICK
(Per Net Ton Seaboard Base)

9 x 4½ x 2½	$65.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$50.00

Puddlers' Wages Remain at $13.88 Per Ton

For the first time since May, 1922, wages of puddlers for the next bimonthly period fail to show an advance. The puddlers employed in the mills represented by the Western Bar Iron association will receive in September and October $13.88, the same as for July and August.

The average selling price of bar iron during the last two months was 2.50c per pound, compared with 2.35c previously. Wages are based on these average selling prices. The puddling rate at the peak in January and February, 1921 was $18.70, while the general average for 1914 was $5.60. Following are comparisons of selling prices since January, 1919:

	1923	1922	1921	1920	1919
Jan.-Feb.	2.25c	1.60c	2.80c	2.55c	3.10c
Mar.-Apr.	2.35c	1.50c	2.55c	2.70c	2.75c
May-June	2.50c	1.60c	2.30c	3.00c	2.50c
July-Aug.	2.50c	1.70c	1.85c	3.25c	2.50c
Sept.-Oct.	....	1.95c	1.70c	3.40c	2.50c
Nov.-Dec.	....	2.20c	1.65c	3.55c	2.50c
Yearly av..	....	1.76c	2.14c	3.08c	2.64c

June Imports of Iron, Ores By Countries

Washington, Sept. 4.—England led in total tonnage as an exported of iron and ores to the United States in June, with the shipment of 16,050 tons of pig iron and 11,745 tons of manganese metals and alloys. Quebec and Ontario were the only shippers to export ferrosilicon to the United States, with a total of 2,258,892 pounds. All of this went to the Buffalo, New York and Michigan customs districts. Following are the imports into the United States by countries for June.

	Pig iron tons	Ferromanganese, manganese and alloys tons	Ferro-silicon pounds	Manganese ore tons
France	....	39	....	....
Germany	150	2	....	33
Russia in Europe	....	....	....	4,005
Turkey in Europe	....	....	....	2,151
England	16,050	11,745	....	....
Scotland	2,100	....	....	....
Canada—Maritime Provinces	2,406	....	....	....
Quebec and Ontario	4,099	....	2,258,892	....
Brazil	....	....	....	23,945
British India	4,678	....	....	2,500
China	550	....	....	....
Java and Madura	....	....	....	6
British W. Africa	....	....	....	3,498
Total—quantity	30,033	11,786	2,258,892	36,138

Demand Light

For Sulphate of Ammonia—Light Oil Distillate Market Dull

New York, Sept. 4.—Domestic prices on sulphate of ammonia have eased off slightly to a range of $3.00 to $3.05, works. Offerings on foreign shipments, however, remain nominally unchanged at $3.30 to $3.35 port in double bags. Demand is at a standstill, with little improvement expected before Oct. 1. At that time it is believed both foreign and domestic consumers will manifest greater interest. The fertilizer trade usually enters the market in the fall for tonnage to supplement their regular contracts.

Dullness is also reflected in light oil distillates, and while some sellers are sold fairly well ahead on industrial benzol and toluol, supplies are in fair volume. The dye and rubber industries at present are showing virtually no interest, and there is no assurance at this time that there will be an early improvement experienced in this particular market.

Notwithstanding this situation, prices are steady. Quotations on pure benzol continue at 27 cents works in tanks and 32 cents in drums; 90 per cent benzol, 25 cents in tanks and 30 cents in drums; toluol, 30 cents in tanks and 35 cents in drums; solvent naphtha, 27 cents in tanks and 32 cents in drums; and commercial xylol, 29 cents in tanks and 30 cents in drums.

While analine dye manufacturers usually come into the market for additional requirements around this time, they have not as yet figured to any extent in trading. As a result the market continues sluggish. Prices, however, are unchanged at 8 cents works for flakes and 9 cents for balls.

Coke Oven By-Products

Spot*

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.27
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.28
Naphthalene flake	0.08
Naphthalene balls	0.09

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$3.00 to $3.05

Contract

Pure benzol	$0.27
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.28
Naphthalene flake	0.08
Naphthalene balls	0.09

*Spot distillates are subject to shading.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

GEORGE S. MACRUM has retired from the active management of Mackintosh-Hemphill Co., Pittsburgh, and J. Ramsey Speer has been elected to succeed him as president of the company. Other changes in the organization have been made and the personnel now is as follows: J. H. Bode, formerly chief engineer, has been elected vice president in charge of operations; D. H. Baum, secretary, has also been elected assistant treasurer; and J. C. McFee, formerly of the sales department, has been elected assistant secretary and also made assistant to the president; E. C. B. Gould has been appointed assistant sales manager; Wm. L. Ditges, assistant chief engineer; S. R. Willock, manager of miscellaneous equipment sales; and C. H. Paul, comptroller. Remaining as heretofore are H. A. Lomax, manager of roll sales; Samuel McMillan, general superintendent of Pittsburgh plants, F. K. Acker, purchasing agent, and J. E. Fawell, remains vice president in charge of sales and engineering.

Philip B. Gale, president of the Standard Screw Co., Hartford, Conn., has returned from a tour of Europe.

D. P. Downing, formerly with the Bethlehem Steel Co. in its San Francisco office has been transferred to the Los Angeles office of that company.

F. M. Wyss, formerly superintendent of the Dunham Co., Berea, O., has been made foundry superintendent for the Michigan Gray Iron Castings Co., Detroit.

M. E. Nolan is in charge of the Pittsburgh office, as district manager, of Agnew, Batteiger & Co., Inc., dealer in coal, coke, ores, pig iron and scrap, etc.

Leon W. Graham, for the past 13 years paymaster of the Greenfield Tap & Die Corp., Greenfield, Mass., has been elected assistant treasurer of the corporation.

Allan C. McKinnie, sales manager of the Stanley Works, New Britain, Conn., completed 25 years of service with the corporation Aug. 25 and was presented with a gold watch by President C. F. Bennett.

Newlin T. Booth has been elected president of the Deemer Steel Casting Co., New Castle, Del. Other officers chosen were Charles F. Jenkins, vice president and treasurer, and George B. Harvey, secretary.

George J. Robinson, vice president of the Robinson Dry Dock & Repair Co., Brooklyn, has returned from England, where he supervised work on LA PLYA, the first vessel of the United Fruit Co. to be driven by diesel engines.

W. G. Armstrong for the past three years general manager of the pressed metals division of the American Tube & Stamping Co., Bridgeport, Conn., has resigned from that company and has become affiliated with the Braselton interests in New York.

H. H. Rice, president of Cadillac Motor Car Co., was chosen first vice president of the board of commerce, Detroit, and Howard E. Coffin, president of Hudson Motor Car Co., was elected third vice president. Mr. Coffin has been active on the board's aviation committee for several years.

Ralph A. Gardner, formerly with the General Electric Co. at its Lynn, Mass., plant, is now with the Stafford Co., Readville, Mass. Mr. Gardner started in the foundry business first as a sales engineer for the Eagle Iron Foundry Inc., Salem, Mass. and soon became treasurer and general manager of the Gardner Co., Salem, Mass.

G. C. Shidle has become affiliated with J. W. Dickson as J. W. Dickson & Co., Commonwealth building, Pittsburgh, in the sale of pig iron, coal, coke, limestone, ferroalloys, light rails, etc. A warehouse will be established where alloys and similar materials will be carried in stock. Mr. Shidle was affiliated for nine or 10 years with La Belle Iron Works, later as Pittsburgh district manager. When the consolidation took place under the Wheeling Steel Corp., Mr. Shidle became associated with Thomas R. Hayward Co., Pittsburgh.

H. V. Freeman, for eight years with the Mack Iron & Wire Works, Sandusky, O., and previous to that connected with the Federal Steel Sash Co., Waukesha, Wis., is president of the H. V. Freeman Co., Lima, O. This company was recently organized to deal in building products such as metal lath, steel sash, etc.

John A. Denholm will act as general sales manager of the combined sales forces of the American Wire Fabrics Corp. and the Wickwire-Spencer Steel Corp. effective Sept. 1, with offices at 41 East Forty-second street, New York. L. G. McDonald will act as western sales manager with headquarters at 208 South LaSalle street, Chicago, from the same date.

A. D. Stewart has been appointed branch manager of the Butte office of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., to succeed R. J. Cobban who has been transferred to the Seattle office. L. C. LaMont succeeds J R. Deering as office manager of the Los Angeles office and A. C. Crocker, formerly special power representative has been appointed manager of the industrial division of the Detroit office succeeding E. A. Wooten.

Frank L. Estep of C. P. Perin & S. M. Marshall Co., consulting engineers, New York, returned August 24 from a trip to England and India in connection with the Tinplate Co. of India. Mr. Estep left in July 1922 and spent eight months in India. The plant of the Tinplate Co. of India, he says, now is in successful operation, although only two of the six hot mills so far have been active, as it has been impossible to train enough men to run the plant on a larger scale. This establishment is the only tinplate plant in India.

Henry J. Bailey formerly vice president of the Consolidated Machine Tool Corp. of America has been selected to fill the presidency of that concern, vacated in the death of Waldo H. Marshall on Aug. 23. Mr. Bailey spent 33 years with Hillis & Jones, Wilmington, Del. He started with that company as an office boy and rose to the presidency, which position he occupied at the time of the absorption of the Hillis company by the Consolidated corporation. The headquarters of the corporation were moved from 17 East Forty-second street, New York, to Rochester, effective Sept. 1, although a district sales office will be maintained under the direction of J. A. Wilson at the Forty-second street address.

Issue New Extras on Bar Iron

First Card to be Issued Since Dec. 3, 1895—Classification of Sizes Simplified—General Character of New Listing Is an Advance—Western Mills Not Charging 10-Cent Extra on Round Edge Bars

A NEW national classification card of extras on bar iron has been issued as of Sept. 1. This represents the first change to be made in the bar iron list since Dec. 3, 1895. The general character of the new card is an advance, although in some sizes the extras have been lowered.

Many alterations in classification as to size appear on the new card and these have been made with the idea of general simplification in the list. The new card carries a 10-cent extra on round edge bars which the western mills have eliminated in making quotations. Eastern mills, however, are observing this extra.

The new extras on iron bands are similar to those on steel bands. A differential of 65 cents over bars has been adopted as the base for bands. Bars at a 2.40c base would make the new band price, with the 65-cent differential, a 3.05c base.

The complete new card on bar iron is as follows:

ROUNDS AND SQUARES

1 to 1⅞	Base
2 to 2⅞	0.20c
3 to 3½	0.50c
3⅝ to 4	0.80c
4⅛ to 4½	1.00c
4⅝ to 5	1.30c
5⅛ to 6	1.80c
6⅛ to 6½	2.20c
6⅝ to 7¼	2.50c
¾ to 15/16	0.05c
5/8 to 11/16	0.10c
9/16	0.15c
½	0.20c
7/16	0.30c
⅜	0.40c
11/32	0.55c
5/16	0.70c
9/32	0.85c
¼	1.00c
15/64	1.25c
7/32	1.50c
3/16	2.00c

HEXAGONS

¾ to 3 1/16	0.25c
5/8 to 11/16	0.40c
½ to 9/16	0.60c
7/16	0.80c
⅜	1.00c
5/16	1.20c
¼	1.50c

FLATS

1½ to 4 x ⅛ to 1	Base
4¼ to 6 x ⅛ to 1	0.10c
6¼ to 8 x ⅛ to 1	0.60c
8¼ to 10 x ⅛ to 1	0.80c
1⅜ to 4 x 1 1/16 to 1½	0.20c
4¼ to 6 x 1 1/16 to 1½	0.30c
6¼ to 8 x 1 1/16 to 1½	0.60c
8¼ to 10 x 1 1/16 to 1½	0.90c
2 to 4 x 1⅝ to 2	0.50c
4¼ to 6 x 1⅝ to 2	0.60c
6¼ to 8 x 1⅝ to 2	0.80c
8¼ to 10 x 1⅝ to 2	1.00c
2 to 4 x 2⅛ to 3	0.60c
4¼ to 6 x 2⅛ to 3	0.80c
6¼ to 8 x 2⅛ to 3	1.00c
2 to 4 x 3⅛ to 3¼	0.70c
4¼ to 6 x 3⅛ to 4	1.00c
2 to 4 x 3⅜ to 3¾	0.80c
12 x ⅜ to 1	1.30c
12 x 1⅛ to 1½	1.40c
12 x 1 9/16 to 2	1.60c
1⅛ to 1⅜ x ⅜ to 1	0.05c
1 to 1 1/16 x ⅜ to ⅞	0.10c
⅞ to 15/16 x ⅜ to ⅞	0.20c
¾ to 13/16 x ⅜ to ¾	0.30c
⅝ to 11/16 x ⅜ to ⅝	0.40c
9/16 x ⅜ to ½	0.50c
½ x ⅜ to 7/16	0.70c

FLATS—¼ TO 5/16 THICK

12 x ¼ to 5/16	1.30c
8¼ to 10 x ¼ to 5/16	1.00c
7 to 8 x ¼ to 5/16	0.70c
6¼ to 6¾ x ¼ to 5/16	0.50c
4¼ to 6 x ¼ to 5/16	0.30c
1½ to 4 x ¼ to 5/16	0.20c
1 to 1⅜ x ¼ to 5/16	0.25c
¾ to 15/16 x ¼ to 5/16	0.40c
⅝ to 11/16 x ¼ to 5/16	0.60c
½ to 9/16 x ¼ to 5/16	0.90c
⅜ to 7/16 x ¼ to 5/16	1.40c

OVALS

¾ to 2½ x ⅜ and over	0.30c
¾ to 2½ x ¼ to 5/16	0.40c
¾ to 2½ x 5/32 to 3/16	0.70c
⅝ to 11/16 x 5/16 and over	0.50c
⅝ to 11/16 x 3/16 to ¼	0.70c
⅝ to 11/16 x ⅛ to 5/32	1.00c
½ to 9/16 x ¼ and over	1.00c
½ to 9/16 x ⅛ to 3/16	1.30c
½ to 9/16 x 3/32	1.60c
⅜ to 7/16 x 3/16 and over	1.60c
⅜ to 7/16 x ⅛ to 5/32	2.00c
⅜ to 7/16 x 3/32	2.40c

HALF OVALS

1 to 4 x ¼ and over	0.40c
1 to 4 x Nos. 7, 8, 9 and 3/16	0.50c
1 to 4 x Nos. 10, 11, 12 and ⅛	0.70c
¾ to 15/16 x 3/16 and over	0.70c
¾ to 15/16 x Nos. 10 11, 12 and ⅛	0.90c
¾ to 15/16 x Nos. 13, 14 and 15	1.20c
⅝ to 11/16 x 5/32 and over	0.90c
⅝ to 11/16 x Nos. 10, 11, 12 and ⅛	1.20c
⅝ to 11/16 x Nos. 13, 14, 15	1.40c
½ to 9/16 x ⅛ and over	1.20c
½ to 9/16 x Nos. 13, 14 and 15	1.60c
⅜ to 7/16 x 3/32 and over	2.00c
⅜ to 7/16 x Nos. 14 and 15	2.40c

HALF ROUNDS—SOLID

1 to 3	0.30c
¾ to 15/16	0.50c
⅝ to 11/16	0.70c
½ to 9/16	1.00c
⅜ to 7/16	1.50c

BANDS

	Net extras
1 7/16 in. x Nos. 7, 8, 9 and 3/16 in.	Base
4 1/16 to 6 in. x Nos. 10, 11, 12 and ⅛ in.	0.10
1 7/16 to 4 in. x Nos. 10, 11, 12 and ⅛ in.	0.05
1 to 1⅜ in. x Nos. 7, 8, 9 and 3/16 in.	0.05
1 1/16 to 1⅜ in. x Nos. 10, 11, 12 and ⅛ in.	0.10
15-16 in. x Nos. 7, 8, 9 and 3/16 in.	0.10
15/16 to 1 in. x Nos. 10, 11, 12 and ⅛ in.	0.15
⅞ in. x Nos. 7, 8, 9 and 3/16 in.	0.15
⅞ in. x Nos. 10, 11, 12 and ⅛ in.	0.25
13/16 in. x Nos. 7, 8, 9 and 3/16 in.	0.20
13/16 in. x Nos. 10, 11, 12 and ⅛ in.	0.30
11/16 to ¾ in. x Nos. 7, 8, 9 and 3/16 in.	0.30
¾ in. x Nos. 10, 11, 12 and ⅛ in.	0.35
11/16 in. x Nos. 10, 11, 12 and ⅛ in.	0.40
9/16 to ⅝ in. x Nos. 7, 8, 9 and 3/16 in.	0.40
9/16 to ⅝ in. x Nos. 10, 11, 12 and ⅛ in.	0.45
½ in. x Nos. 7, 8, 9 and 3/16 in.	0.45
½ in. x Nos. 10, 11, 12 and ⅛ in.	0.55
7/16 in. x Nos. 7, 8, 9 and 3/16 in.	0.70
7/16 in. x Nos. 10, 11, 12 and ⅛ in.	0.85
⅜ in. x Nos. 7, 8, 9 and 3/16 in.	0.75
⅜ in. x Nos. 10, 11, 12 and ⅛ in.	1.00

MACHINE-CUTTING TO SPECIFIED LENGTHS

Rounds and Squares 1½ Inches and Larger

Machine-cutting to lengths over 48 inches	0.20c
Machine-cutting to lengths over 24 inches to 48 inches inclusive	0.30c
Machine-cutting to lengths over 12 inches to 24 inches inclusive	0.40c
Machine-cutting to lengths of 12 inches and less, extra will be furnished on application, but will not be less than	0.70c

Extras for machine-cutting rounds and squares under 1½ inches, flats, etc., will be furnished on application.

CUTTING TO SPECIFIED LENGTHS OTHER THAN MACHINE-CUTTING

Cutting to lengths over 48 inches	0.10c
Cutting to lengths over 24 inches to 48 inches, inclusive	0.15c
Cutting to lengths over 12 inches to 24 inches, inclusive	0.30c
Cutting to lengths of 12 inches and less, extra will be furnished on application, but will not be less than	0.40c

STRAIGHTENING

Machine straightening	0.10c

QUANTITY DIFFERENTIALS

All specifications for less than 2000 pounds of a size will be subject to the following extras, the total weight of a size ordered to determine the extra, regardless of length and regardless of exact quantity actually shipped. Quantities less than 2000 pounds but not less than 1000 pounds 0.20c

Quantities less than 1000 pounds 0.50c

NOTES

For intermediate sizes, the next higher extra to be charged in all cases.

Chicago Production Is Continuing High

Chicago, Sept. 4.—Heavy shipments from all steel mills in this district during the last few weeks have finally overcome the big lead of back orders which existed a month ago and now 90 day deliveries are being made in most all commodities. The Steel Corporation reports production during the past week 93 per cent of capacity or a slight improvement over the production of the preceding week. The increased cost of production in departments where the shorter hour has been adopted is still an uncertain quantity, but the actual tonnage produced has in no way been lessened.

More Bad Locomotives

Washington, Sept. 4.—Locomotives in need of repair on Aug. 15 showed an increase of 16 over the number in need of repair on Aug. 1, according to reports to the car service division of the American Railway association. Locomotives in need of repair on Aug. 15, totaled 11,571, or 18.1 per cent of the number on line. On Aug. 1 there were 11,555, or 18.1 per cent, in need of repair. Of the total number on Aug. 15, reports showed 10,487, or 16.4 per cent in need of heavy repair. This was an increase of 117 over the number in need of such repair at the beginning of the month.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE National Standard Co., manufacturer of steel and wire products, has completed realty transactions whereby it acquires a site 60 x 200 feet along the Baltimore & Ohio tracks, for the opening of a new plant in Akron, O. Operations will commence within several months. The National company's products include automobile jacks, trucks, truck jacks, railroad tools, air compressors and lead cables for tires. One or two new buildings are to be erected on the 5-acre site.

* * *

THE new plant of the American Chemical Paint Co. at Ambler, Pa., will be ready for occupation about Nov. 1. The building was designed especially for the manufacture of rust removing and rust preventing chemicals.

* * *

THE Diamond Needle & Mfg. Co., Torrington, Conn., has purchased the John Henry plant in that town and will move from its present factory on Dewey street as soon as alterations and improvements are made. Increased business made the larger plant necessary.

* * *

THE Armstrong Cork & Insulation Co. Pittsburgh, has established a warehouse in connection with its Detroit office. A complete stock of insulating materials are now being carried. The new office, in charge of W. C. Rasch, is located in the Cass building, 453 Fort Street West, Detroit.

* * *

AGNEW, BATTEIGER & CO., INC., Widener building, Philadelphia, merchant in coal, coke, ores, alloys, fluxes, pig iron, scrap, and kindred materials, announces the opening of an office at 1601 Oliver building, Pittsburgh, in charge of M. E. Nolan as district manager.

* * *

THE Phillips & Buttorff Mfg. Co., of Nashville, Tenn., one of the largest manufacturers of stoves and ranges in the southern field, has just finished construction of an additional unit to its plant costing about $80,000, which will increase total capacity of the plant to about 90,000 stoves and ranges per year, according to an announcement by B. E. McCarthy, president. This is one of the pioneer foundry companies of the South, having been originally formed in 1881, and now operating three complete foundries and three furnaces in addition to shops.

* * *

SOME of the creditors of the Stevens-Duryea, Inc., Willimansett, Mass., builder of automobiles, a $6,000,000 corporation, object to the receivers selling the property for $450,000 to an unnamed syndicate. The court will give them a hearing Sept. 15. The receivers had recommended acceptance of the offer.

* * *

BUFFALO FOUNDRY & MACHINE CO. has taken over the interests of the Cannon-Swenson Co. of Chicago, consulting and contracting engineers. Martin J. Kermer, formerly chief engineer of the Cannon-Swenson Co. is to remain in charge of the Chicago office with headquarters at 1636 Monadnock block.

* * *

PLANS will be prepared at an early date for the construction of a plant for the Delaware Steel Products Co., New Castle, Del., which has acquired a site adjoining the Deemer Steel Castting Co., the latter has been reorganized and is interested in the Delaware company. The Delaware company which was recently organized will produce alloy materials, steel products, etc.

* * *

ABSORPTION of the Dominion Radiator Co. by the American Radiator Co. has been completed, as announced in Toronto, Ont., Aug. 25. The Dominion Radiator and Boiler Co., Ltd., New York, the American Radiator Co.'s new subsidiary, will operate the old Dominion company in Toronto, and the Canadian branch of the American company at Brantford, Ont.

* * *

THE first mold in the new foundry of the Pacific Gas Radiator Co., Los Angeles, was poured recently with A. J. Hartfield, president, officiating. The company started about ten years ago when Mr. Hartfield first made his house heating equipment in the rear of a small store. Today there are over 225,000 installations, many being in churches, schools, hospitals, hotels, office buildings and other large structures.

* * *

THE manufacture of hollow metal doors and trim, as well as rolled and drawn steel and bronze moldings for architectural, automotive and other fields will be continued by the United Metal Products Co., recently incorporated at Canton, O., and purchaser of the properties of the former Central Metal Products Corp.

* * *

LOGEMAN BROS. CO., Milwaukee, manufacturers of baling and scrap metal presses have purchased the business, patents and good will of the Chicago Baling Press Mfg. Co., Chicago, and are now prepared to furnish mechanical presses to those metal manufacturing concerns whose accumulation of scrap material is of so light a quantity or gage as not to warrant use of hydraulic equipment. The entire business is now carried on from the Milwaukee office.

* * *

PROBABLY the largest contract for transformers ever booked in a single order is that awarded the Allis-Chalmers Mfg. Co., of Milwaukee by the Public Service Co. of New Jersey for its new steam plant at Kearney, N. J. The order calls for 18 units of 15,000 kilovolt amperes capacity each, for 137,000 volts. The same company also has ordered two large surface condensers from Allis-Chalmers Mfg. Co. for the same project. The transformers will cost about $650,000 and the condensers $250,000.

* * *

IN explanation of his purchase of 1000 automobile cars for the Canadian National railways in the United States Sir Henry Norton, president of the road, stated that because the cars would be used almost entirely in the United States they would be subject to a 30 per cent tax on entering that country, if manufactured in Canada. The purchase of the cars in the United States is said to have saved the company approximately $1,000,000. Criticism over his purchase had arisen in Canada where it was claimed Canadian builders had not been invited to bid.

New Era For Labor Reached

Secretary Davis Declares Day of the Educated Worker Has Dawned in American Industry—Less Thought for "White Collared Job," More for Craftsmanship—Lauds Harding's Efforts

WASHINGTON, Sept. 4.—Uncommon confidence in the financial and industrial structure of the United States and a profound conviction that American labor never before has been in so comfortable and envious a position, were voiced by Secretary of Labor James J. Davis, in his Labor Day address at Birmingham, Ala.

Secretary Davis' appraisal of the labor situation is the more apt in view of the fact he has just returned from an extended, personal inquiry into labor conditions abroad, especially in the United Kingdom. He observed, among other things, that it is through the "untiring industry and devotion to the ideals of American labor" of the late President Harding that this Labor Day found the 12-hour workday and the 7-day week practically eliminated from the steel industry. Secretary Davis said in part:

"Labor Day this year finds the workingmen and women of America at the close of the 12 months of steady progress, of peace and of prosperity, but marked by one great loss, the death of Warren G. Harding, our late President, a great friend of America's toilers. During the more than two years of his service, labor in America made greater strides in steady, consistent, material and moral progress than it had during any similar period in the history of our country. Under his calm guidance the American workman was led from the verge of economic chaos to stable employment, record wages, and improved conditions. Not since the foundation of the republic has American labor, organized and unorganized, been in a better condition than it is on this Labor Day. * * *

"The services of the department commissioners of conciliation have been called for in 534 cases during the year, involving strikes or threatened strikes. Of these 428 disputes have been adjusted or settled. In addition 87 disputes which were pending at the beginning of the year have been adjusted. Year by year experience is demonstrating both to labor and management the fact that the best time to settle an industrial dispute is before it has come to the point of an appeal to force. A suspension of production in any industry today means loss to both employer and worker, as well as to the public which the industry serves, and the prosperity of the whole country which is ultimately based upon continuous production. I hope to live to see that Labor Day of the future when no American industry will allow any dispute between worker and employer to reach the strike stage with its misery, sorrow and despair.

"Here in the United States we have reached a new era for labor—the era of the educated workman. We have always prided ourselves on our American thirst for education, but within the past few years, since the great war, educated Americans have been turning more and more to the manual and mechanical trades. We are making progress away from the fetish of the white-collar job. The patriotic impulses of the war, together with the increased wages caused by war demands for production, taught many of our young men that in the ranks of manual labor they could find healthy employment at remunerative wages. Most of these young men were of the so-called educated classes, and they brought to the field of manual labor an educational standard which has been bearing results, for the intelligent workman trained in his craft is the best workman, for himself for his employer and for his community. That education which combines the training of head and heart and hand is the education which will elevate labor to its proper place in the human scale of things.

"Both employer and employe in America are steadily realizing the importance of co-operation, are more and more convinced that they are partners in production, and that intelligent working together offers the best results for both of them. As standards of intelligence among our workers improve they are reaching the point where they stand on a more nearly equal basis with the employer in their negotiations and in their daily life. Many causes are contributing to this better feeling between the workers who make industry possible and the men who manage industry. Labor in many crafts has already established apprentice schools, where beginners may be trained in the trades, and where at the same time, they may have their full share of academic instruction. Labor is coming to know that the worker who can visualize his completed task, the carpenter who can see in the future the great building for which he saws the board, is the worker who gets the most out of life in material and spiritual returns.

"More and more I am convinced of the wisdom of the conviction of our late President Harding in his belief that the hope of the world lies in this country. Everywhere else there is political and economic chaos, and it is only in this country that employer and workman are moving steadily forward under the banner of industrial peace and prosperity. Abroad unemployment is the rule, while in America every workman who is willing and able to work has the opportunity to fill a job. Abroad wages are low, and many workers are being paid a mere subsistence wage. Here wages are generally as high as they ever have been. Both through the pay envelope and through various systems of profit sharing, many industries are reaching that condition of an equitable division of the proceeds of production between the men who manage labor and the men whose labor makes industry possible. On this basis alone can we insure permanent progress and growing prosperity."

Ship Mill Equipment

Final shipment of sheet mill equipment for the new plant of the Michigan Steel Corp., Detroit, recently was made. The new plant includes seven stands of 28 x 46-inch, two stands of 28 x 40-inch and one stand of 29 x 56-inch hot mills and a 1500-horsepower gear drive. Three 54-inch steam doublers will serve the hot mills. The shearing department will include two 126-inch, one 156-inch and one low-type lever shear. Six units will be installed in the cold roll department, these consisting of four 26 x 50-inch and two 26 x 56-inch mills, driven through a 200-horsepower gear reduction set. The foregoing equipment and a No. 3 roll lathe were built by the Mesta Machine Co., Pittsburgh.

Airship Girders Tested

Duplicates of the framework girders of the new navy airship have been subjected to tests which would indicate the strength of the members under actual working loads. In all, 147 girders were tested. The results of the tests were consistent both as to type of failure and breaking load, most of the failures being elastic in character and not due to any defect in workmanship or material.

The girders were made at the naval aircraft factory in Philadelphia, and are of duralumin, an alloy of aluminum and copper. This alloy is so light that a man can lift a 10-foot girder length with his little finger but it is so strong that, when supported at both ends, it will carry all the men who can find room to sit on it.

The number of employes in 79 factories reporting to the Detriot Employers association decreased by 163 in the week ended July 23, bringing the total number to 222,786.

Tool Demand Still Is Restricted

Railroads Purchase a Few Machines and Starter Manufacturer Buys Half Dozen Items—Dealers Believe September Will Witness Turn for Better Demand, Although Present Volume of Inquiry Is Not Heavy

EXCEPT for a moderate volume of railroad purchases, the machine tool market during the past week has maintained the dullness which has characterized it during the summer months. Some tool makers and dealers, in checking up their sales for August, declare the past month's business was below that of July. Despite this condition, there is a strong current of optimism throughout the trade in the form of a belief demand will be better in September and in the months of the last quarter. This feeling is held in spite of the fact inquiries now at hand do not indicate any immediate improvement.

Perhaps the outstanding purchases of the week by a single manufacturer were those of the Gray & Davis Co., Cambridge, Mass., makers of automobile starters. This company ordered five lathes, three shapers, a quantity of drilling machinery and a number of turret lathes. The Central Railroad of New Jersey has followed its recent purchases by buying an axle journal lathe, a car wheel borer, a shaper and a punch and shear. The Seaboard Air Line has closed on seven of the 20 tools on its list, while the Elgin, Joliet & Eastern has bought a planer, boring mill, wheel lathe and axle lathe. A Japanese inquiry for 20 tools has been issued through a New York house.

Prices remain firm and in a few instances advances have been announced by manufacturers, particularly of drilling machines.

Place Orders in East for Railroad Shop Tools

NEW YORK, Sept. 4.—The dullness in the local machine tool market of late has been most pronounced the past few days. Excepting a few instances, orders have been confined to one and two tools, and have been scattered. One of the largest buyers in this district has been Gray & Davis, Inc., Boston, who had closed on five lathes, three or four shapers and several sensitive drills. It is understood further equipment is yet to be purchased. The Central Railroad of New Jersey, reported last week as closing on four engine lathes and two turret lathes, has just purchased a locomotive axle journal turning lathe, a car wheel borer, a shaper and a punch and shear.

The Seaboard Air Line, figuring on a list of 20 machine tools, has closed on seven items, including four fabricating machines and pipe bending machines. Action on the remainder of the list has been indefinitely postponed. The Elgin, Joliet & Eastern has placed an order with an eastern builder for a 30-inch planer, a 44-inch boring mill, a car wheel lathe and a journal turning axle. Sing Sing prison, Ossining, N. Y., has closed on a 60-ton hydraulic press. Davis, Hoy & Stumpf, 149 Broadway, New York City, has sold a used 7-inch bar horizontal boring mill to the W. M. Kellogg Co., Jersey City.

While little has come out in the way of domestic inquiry, a couple of sizable lists have come out for export. One involving about 20 items for shipment to Japan, has been issued by Takata & Co., 50 Church street. The list includes bending rolls, plate shears, a pipe bending machine, a pipe threading machine, a cold saw, a sensitive drill, a hack saw and five automatic hammers. One of the largest single items now on inquiry is a slotter, costing around $30,000, for the General Electric Co., Schenectady, N. Y. Fresh railroad inquiry is virtually lacking.

Calendar and Selected News of Plant Liquidations, Wholesale Offerings, Auctions of Used and New Equipment, Etc., page 114, Classified Machinery Section.

While a fairly good number of orders are reported in the crane market, there is little outstanding. Four or five locomotive crane orders are included in the week's business.

Conditions Are Better

BOSTON, Sept. 4.—Conditions turned for the better in the machine tool market in this section during the past week and dealers express greater hopefulness over the future prospects. The feature of the week was the large purchases of equipment by the Gray & Davis Co., Cambridge, Mass. This company has a large contract to make self-starters for the Essex motor car. The work necessitates additions to the present plant and equipment purchases therefore are said to amount to about $300,000. Two new buildings are being equipped with machinery. Local interests received a good share of the business and some of them were called upon to make delivery immediately by motor truck. One dealer contracted for five lathes and three shapers, and others received orders for drilling machinery and turret lathes. In addition to the Gray & Davis business, an increase in the number of single orders was reported. One electrical company in New England purchased a heavy squaring shear. Inquiries for machinery and tools are expanding. A drill manufacturer in the Middle West has advanced his prices 10 per cent effective as of Sept. 1 and it is thought in the trade here that other manufacturers may follow suit. A surface grinder and a 24-inch drill were sold during the week by a local dealer.

Buyers Hold Off

PITTSBURGH, Sept. 4.—Occasional sales of one or two machine tools at a time are noted in the equipment market but big buying continues to halt. The Pennsylvania railroad, for instance, has not started on its list and action on one or two other fair sized inquiries

pending, continue to be deferred. Several dealers report a greater movement this past week than in several weeks previous of small items, such as hack saws, grinders, drill presses, etc. One or two fair-sized lathes have been disposed of but in general the market is quiet and no new large lists are coming out.

Prospects are bright for continued good business in the used machinery field. A certain group of manufacturers are keenly on the alert for bargains in usable equipment when the machines are 75 per cent of new. Several projects are up for which second hand machinery will be bought, including several from a distance. From time to time crane deals likewise are consummated, the feature this week being the purchase from the Alliance Machine Co. by the Westinghouse Electric & Mfg. Co. of two cranes for its South Philadelphia works. The Hoover, Owens & Rentschler Co., Hamilton, O., closed on a 3-ton 2-motor cab-operated monorail hoist through the Pittsburgh office of the Milwaukee Electric Crane & Mfg. Co.

Tools Move Slowly

CHICAGO, Sept. 4.—Dealers in new machine tools find that the total August sales were below the moderate sales of July and the whole tool market in this district is inactive. Used tools are moving more freely than the new tools, but it is natural for the used tool market to show less seasonal change than the new market. This is the midst of the summer lull in buying of new equipment and while inquiry as yet does not predict an early fall buying movement, dealers are all hopeful and general conditions point to an improvement in the market during September.

The railroads continue to be the chief buyers. The Elgin, Joliet and Eastern bought ten tools during the past week, completing the long list against which this road has been buying for several weeks. The Illinois Central and Santa Fe railroads both bought a few tools not against any issued lists. The Union Pacific, which brought out a long list some time ago, has withdrawn this inquiry and is reported out of the market.

Tone Improves Slightly

CLEVELAND, Sept. 4.—The tone of the market for machine tools and shop equipment continues to show slight improvement. Sales during the past week, while still confined to orders of one or two tools, increased in volume. A greater number of inquiries are being brought out from time to time from industries engaged in the manufacture of variety of products. This slight awakening in the machinery market after three months of relative inactivity has caused several men of the industry to express the belief that the market will show a steady improvement after Labor day. No large sales or inquiries are reported for the week.

During the past week improvement has also been noted in the used machinery market. Several sales of equipment consisting chiefly of small tools are reported, and inquiries have increased. Several Cleveland manufacturers are figuring on machines, which may be closed soon. One dealer has taken over the machinery of a tool manufacturing company in St. Louis and is selling the equipment.

Crane demand continues at a high rate. Plants are sold ahead for several weeks at the present time and numerous inquiries are being brought out from manufacturers.

Demand Is Encouraging

TORONTO, Sept. 4.—Local dealers state that the month of August will show very good results in so far as actual sales of machinery and machine tools are concerned. While large lists were almost entirely absent from the market during the month a steady flow of small orders made their appearance and it is this class of business that held up the demand. During the past week sales were somewhat augmented by demonstrations of tools at the Canadian National exhibition, Toronto, where buyers are showing keen interest in various new lines of equipment that are to be seen there. The automobile and woodworking industries are furnishing the greater part of the present demand for tools and machinery and from these concerns dealers are continually closing orders, chiefly for tools in small quantities. Considerable improvement has made its appearance in the demand for rebuilt tools and dealers handling this class of equivalent report steady business. The demand for small tools is holding strong and orders are continually appearing both for present needs of buyers and for use in the future.

Inquiry for machinery and machine tools is improving and during the past few days dealers have received many statements regarding the purchase of equipment for new plants as well as for replacement purposes. Porritt's & Spencer (Canada), Ltd., Lotteridge street, Hamilton, Ont., is asking for equipment for manufacture of pulp and paper makers' felt.

Crane Awards and Inquiries of the Week

Orders Placed

Two 10-ton electric traveling cranes with 5-ton auxiliaries and with 47-foot 2½-inch span, with no electrical equipment, to the Alliance Machine Co. for the Westinghouse Electric & Mfg. Co., South Philadelphia, Pa.

One 3-ton 2-motor cab-operated monorail hoist for the Hooven, Owens & Rentschler Co., Hamilton, O., to the Milwaukee Electric Crane & Mfg. Co.

One 30-ton crane for the Carnegie Steel Co., for use at Mingo Junction, O., to McMyler Interstate Co., Bedford, O.

One 10-ton gasoline-operated trolley type crane for the Richardson Construction Co., Los Angeles, Cal., for use in New Mexico, to McMyler Interstate Co., Bedford, O.

One 5-ton electric crane, 26-foot span, for the East Cambridge, Mass., plant of the Worthington Pump & Machinery Corp., reported placed with the New Jersey Foundry & Machine Co.

One 20-ton locomotive crane for Viele, Blackwell & Buck, New York City, to the Browning Co.

One 20-ton locomotive crane for the American Gas & Electric Co., through the Foundation Co., New York city, to the Brown Hoisting Machinery Co.

One 20-ton locomotive crane for the Norfolk & Western railroad, to unnamed builder.

One small electric crane, 22-foot span, for the Western Electric Co., Chicago, to the Whiting Corp.

One 10-ton overhead crane, 45-foot span, for the Pennsylvania Power Co., Madison, Wis., to the Whiting Corp.

One 7-ton caterpillar crane for the S. A. Dunn & Sons Co., Rensaeller, N. Y., to the Orton & Steinbrenner Co.

One 20-ton handpower crane, 37-foot span, for the Boston Elevated Co., Boston, to the Whiting Corp.

One 10-ton handpower crane, 29-foot span, for the Hubbard Floyd Co., Boston.

One 500-foot monorail system for the Poughkeepsie Foundry & Machine Co., Poughkeepsie, N. Y., to the Chisholm Moore Co.

One 5-ton electric crane, 51-foot span, to the Westinghouse Electric & Mfg. Co., Pittsburgh, to the Whiting Corp.

Two 5-ton portable cranes, 90-foot radius, for the Dutton Lumber Co., Poughkeepsie, N. Y., to Heyl & Patterson.

One 10-ton electric crane, 53-foot span, for the Commonwealth Edison Co., Chicago, to the Whiting Corp.

One 15-ton electric traveling crane for the General Engineering & Management Corp., 165 Broadway, to an unnamed builder.

Two used Brown Hoist locomotive cranes to Leo E. Kelly, Brooklyn, to Brooklyn contractor.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

HARTFORD, CONN.—The Haynes-Murphy Co. has been incorporated with $2,000,000 capital to build machines. D. Haynes Murphy, Otto A. Fredrickson and Louis S. Zahronsky are the incorporators.

MIDDLETOWN, CONN.—Wilcox, Crittenden & Co., Inc., has let the contract for a brick and steel, mill construction, 3-story 60 x 60-foot factory addition.

PLAINVILLE, CONN.—The Standard Steel & Bearings, Inc., has let the contract for a brick and steel, 1-story, 60 x 100 foot forge shop.

WINSTED, CONN.—The Winsted Edge Tool Works, Inc., has let the contract for a 1-story, 40 x 90-foot factory addition.

ATLANTA, GA.—Plans are being made for the operation of metal properties by the Crown Mining & Mfg. Co., P. O. Box 1751, a company recently incorporated for $1,000,000.

ALTON, ILL.—The Wonder Truck & Tractor Co., 917 East Broadway, was incorporated with $200,000 capital to manufacture and sell farm tractors, implements, etc. Inrorporators were William Savidge, M. F. Becker, John Strober, R. H. Dalby, W. M. Edinger, Luras Haefner and Charles F. Meier.

CHICAGO—A 1-story, 100x390-foot, $80,000 addition is being planned for the Chicago Steel & Wire Co., 103rd street and Torrence avenue.

CHICAGO—Chicago Motor Bus Co., 124 Rosemont avenue will install a machine shop in the new automobile service building to be erected at Wilcox and West Adams streets.

CHICAGO—Construction will commence soon on a 3-story addition to the plant of D. O. James Mfg. Co., 1120 West Monroe street, manufacturer of cut gears.

CHICAGO—Goss Printing Press Co. will build new $250,000, 100 x 500-foot factory building of brick and steel at Wood street and Fifteenth place.

CHICAGO—Ajax Tank & Tower Co. will build a $25,000, 2-story warehouse at 1452 West Thirty-eighth street. General contracts awarded to E. W. Sproul & Co., 2001 West Pershing road.

CHICAGO—The factory of the Lincoln Brass & Spinning Works, 3262 Grand avenue, was damaged by fire. The Best Lamp Co. in the same building was also damaged. The loss was approximated at $80,000.

CHICAGO—The Power Appliance Co., 721 West Washington boulevard was incorporated for $20,000 by Edwin A. Gardner, Walter C. Wilck, and Alice R. Linn to manufacture and deal in metal specialties and hardware.

CHICAGO—The Atlantic Radioelectric Distributors, Inc., 733 West Jackson boulevard is incorporated for $5000 to manufacture and deal in radio supplies, electrical machinery and supplies, etc.

CHICAGO—The Holland Power Washing Machine Co. was formed with a capital of $100,000 to manufacture and sell washing machines and household devices. The incorporators were Lloyd I. Ladrich, Marie M. Wilson, and Ray H. Wilson.

EAST ST. LOUIS, ILL.—About 230 acres of land constitute the site of the proposed construction and repair shops for locomotive and car work of the Baltimore & Ohio railroad. The construction work is estimated to cost $1,750,000.

MOLINE, ILL.—Additions costing about $17,000 will be built for the Moline Iron Co., including a 3-story pattern vault, a 1-story core room, and a battery of core ovens.

INDIANAPOLIS—The Carr Baumel Co., an Illinois corporation has qualified to do business in Indiana to manufacture and deal in machinery and tools. It has a capital here of 50 shares no par stock.

MARBLEHEAD, MASS.—The Electrolight Mfg. Co. has been incorporated with $5000 preferred stock and 200 shares of common no par value, by Duncan Dana, Robert D. Weston, Cambridge, Mass., and Charles Weston.

NEW BEDFORD, MASS.—The Reed Mfg. Co., has been incorporated to make tire chains with $50,000 capital, by Edward C. Reed, E. M. Reed, and Albert Morde.

SOUTH WALPOLE, MASS.—The Bird Machine Co. is to erect a brick, 1-story and basement, 80 x 140-foot shop.

TAUNTON, MASS.—The contract for the erection of a 1-story addition for the Magee Furnace Co. was awarded to F. D. Williams, 15 Broadway, New York.

BALTIMORE, MD.—The International Engineering & Construction Co. plans the erection of a $200,000 mechanical works.

DETROIT—Construction will soon begin on the 1-story addition to the plant of the Trippensee Closed Body Corp., 5685 Twelfth street.

ST. JOSEPH, MICH.—Construction of a new concrete $200,000 addition to the Auto-Specialties Mfg. Co. plant here was announced recently. Excavation for the building has been commenced.

CALDWELL, N. J.—Royal Motor Coach Co., Inc., 285 Bloomfield avenue, will buy equipment to provide for an initial capacity of five cars a month to sell at $7000 each. The company was recently organized with $500,000 captial.

ALBANY, N. Y.—Plans are being drawn for the construction of a 2-story automobile service and repair building for the International Harvester Co., 960 Broadway.

BROOKLYN, N. Y.—National Cement Block Co. will build a $25,000, 1-story, 42 x 87-foot factory at 4305 Glenwood road. Plans have been completed.

BROOKLYN, N. Y.—Contract for the construction of a 5-story addition to the plant of the National Lead Co., 105 York street, has been let to Rufus H. Brown Co., 356 Pearl street.

BUFFALO, N. Y.—A $100,000, 1-story factory building will be erected by the Houde Engineering Corp. on Northland avenue. Plans are expected to be completed about Nov. 1.

BUFFALO, N. Y.—Finlay Wheeler, Inc., dealer in machinery, filed a petition in bankruptcy Aug. 16 with liabilities of $15,053 and assets of $3917.

CAZENOVIA, N. Y.—Zuill & Jones, was incorporated for $5000 by H. B. and A. Zuill and F. L. Jones to deal in machinery and engines.

NEW YORK.—Merchants Equipment Corp., was incorporated for $125,000 by J. I. Eiferman to manufacture metal fixtures, etc.

NEW YORK—Watson Home Co. will erect a machine shop, in a 2-story automobile service and repair bdilding, 100x145 feet, at a cost of about $100,000..

NEW YORK—Pioneer Instrument Co., manufacturer of aircraft instruments, will remove and consolidate its plant with Brandis & Sons, Inc., 754-8 Lexington avenue, Brooklyn.

NEW YORK—Fiwale Equipment Mfg. Co., was incorporated for $25,000 by A. Watte, R. J. Fisher, to manufacture asbestos and mineral belt.

NEW YORK—Associated Equipment Co. was incorporated for $10,000 by D. M. S. Hegarty, D. S. Conoley, and J. B. Streit, to deal in metal products.

NEW YORK—Webster Radio Corp. was incorporated for $10,000 to make radio parts. Incorporators were L. Kaplan, F. R. Linden and R. E. Sackstein.

NEW YORK—The Lorenson Matthews Mfg. Co. has been incorporated to manufacture tools and machinery with a capital of $100,000 L. C. Lorenson, E. H. Lorenson and M. E. Nedmeyer were the incorporators.

OSWEGO, N. Y.—The Buffington Co., Inc., manufacturer of metal furniture at 324 Madison avenue, New York, reports that excavations

Business Changes

OFFICES of the Beardsley & Piper Co., have been moved to 2451 North Keeler avenue, Chicago. The Beardsley company, manufacturer of foundry machinery, will have an increased capacity of from two to six machines a week.

* * *

The Consolidated Machine Tool Corp. of America moved its offices from New York to Rochester, N. Y., effective Sept. 1.

* * *

Milton Pray Co., with offices in San Francisco, Los Angeles and Seattle, has been appointed Pacific Coast representative for the Cleveland steel Co., Cleveland.

* * *

The Matthiessen & Hegeler Zinc Co. has moved its offices in New York to suite 812 Trinity building, 111 Broadway. John L. Glover, eastern sales manager, assisted by William A. Cooke will be in charge of the office.

A Furnace is built to heat the stock, not incoming air!

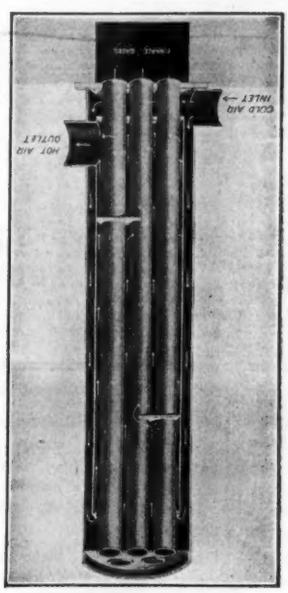
But when it is equipped with a

Calorized Recuperator

it also heats the air that is burnt with the fuel. The result is that it requires *20% to 30% less fuel* to maintain the proper furnace temperature!

A Calorized Recuperator is one in which the tubes have been subject to the calorizing process. In this process, patented by the General Electric Company, aluminum is driven into the metal so as to form an aluminum alloy surface. This surface has the combined qualities of *resisting high heat*, reducing the effects of carbon, and resisting the corrosive action of sulphur, etc.

Heat Your Air with Waste Gases and Bank the Saving



From the standpoint of a dividend paying proposition, you'll have to travel a long way to equal the returns from an investment in a Calorized Recuperator. If you want the full facts, send coupon.

THE CALORIZING COMPANY

General Offices: **Oliver Bldg., Pittsburgh, Pa.**

50 Church St. NEW YORK, N. Y.
2245 Michigan Ave. CHICAGO, ILL.
424 West Bldg. HOUSTON, TEX.
2-220 General Motors Bldg. DETROIT, MICH.
720 Commerce Bldg. KANSAS CITY, MO.

Clip this coupon

Information which will enable me to determine the fuel I can save with a Calorized Recuperator interests me.

Name:_____ Position:_____

Company Name:_____

Address:_____

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.515c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Cleveland	3.36c
Detroit	3.35c
Los Angeles	4.30c
New York	3.54c
Philadelphia	3.55c
Pittsburgh	3.15c
San Francisco	3.75c
Seattle	4.10c
St. Louis	3.35c
St. Paul	3.45c

IRON BARS

Boston	3.515c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Detroit	3.35c
New York	3.54c
Philadelphia	3.55c
St. Louis	3.35c

SHAPES, STRUCTURAL

Boston	3.615c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Los Angeles	4.40c
New York	3.64c
Philadelphia	3.65c
Pittsburgh	3.25c
San Francisco	3.60c
Seattle (large shapes)	4.20c
St. Louis	3.45c
St. Paul	3.55c

PLATES

Boston	3.615c
Boston 3/16-inch	3.04c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Detroit, 3/16-inch	3.45c
Los Angeles	3.65c
New York	3.64c
Philadelphia	3.65c
Philadelphia, 3/16-inch	3.95c
Pittsburgh	3.25c
San Francisco	3.75c
Seattle	4.25c
St. Louis	3.45c
St. Paul	3.55c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.615c
Buffalo	4.45c
Chicago	4.35c
Cincinnati	4.10c
Cleveland	3.75c to 4.06c
Detroit	4.30c
Los Angeles	5.20c
New York	4.59c
Philadelphia	4.25c
San Francisco	5.25c
Seattle	5.00c
St. Louis	4.45c
St. Paul	4.60c

NO. 28 BLACK SHEETS

Boston	5.45c
Buffalo	5.25c
Chicago	5.20c
Cincinnati	4.90c
Cleveland	4.65c
Detroit	5.15c
Los Angeles	6.50c
New York	4.90c to 5.15c
Philadelphia	5.15c
San Francisco	5.80c
Seattle	6.00c
St. Louis	5.30c
St. Paul	5.45c

NO. 28 GALVANIZED SHEETS

Boston	6.60c
Buffalo	6.35c
Chicago	6.35c
Cincinnati	5.90c
Cleveland	5.60c to 5.80c
Detroit	6.30c
Los Angeles	7.30c
New York	5.95c to 6.15c
Philadelphia	6.25c
San Francisco	6.50c
Seattle	7.00c
St. Louis	6.45c

BANDS

Boston	4.80c
Buffalo	4.35c
Chicago	3.95c
Cincinnati	4.00c to 4.10c
Cleveland	4.01c to 4.16c
Detroit	4.10c
Los Angeles	5.20c
New York	4.39c
Philadelphia	4.35c
Pittsburgh	3.95c
San Francisco	4.50c
Seattle	5.10c
St. Paul	4.20c

HOOPS

Boston	5.80c
Buffalo	4.65c
Chicago	4.55c
Cleveland	4.01c to 4.16c
Detroit	4.95c
New York	5.19c
Philadelphia, 1 inch and wider 20 gage and heavier	4.75c
Pittsburgh	3.95c
Seattle	5.50c
St. Paul	4.80c

COLD ROLLED STEEL

Boston (rounds)	4.75c
Boston (shapes)	5.25c
Buffalo (rounds)	4.70c
Buffalo (shapes)	5.20c
Chicago (rounds)	4.55c
Chicago (shapes)	5.05c
Cincinnati (rounds)	4.50c
Cincinnati (shapes)	5.00c
Cleveland (rounds)	4.25c
Cleveland (shapes)	4.75c
Detroit (rounds)	4.55c
Detroit (shapes)	5.05c
Los Angles (rounds)	5.90c
New York (rounds)	4.65c
New York (shapes)	5.15c
Philadelphia (rounds)	4.35c
Philadelphia (shapes)	4.85c
Pittsburgh	4.25c
San Francisco (rounds)	5.75c
Seattle (rounds)	6.00c
St. Paul (rounds)	4.55c

on its new 1-story plant here are well under way.

WATERTOWN, N. Y.—Safety Tool Corp., was incorporated with 500 shares preferred stock, $100 par value, 1000 of common no par value and $25,000 active capital. Incorporators were H. Bernay, F. H. Lamon, and F. K. Purcell.

BARBERTON, O.—F. A. Sieberling, president of Sieberling Rubber Co., has purchased the plant of the O. C. Barber Concrete Products Co. and will build a rubber reclaiming plant.

BARBERTON, O.—The Portage Foundry Co. has been purchased and will be operated by the East Akron Casting Co. Both the Akron and Barberton plants will be used to make tire cores and molds as under present operation.

BOWLING GREEN, O.—B. C. Kramer, receiver of the Thornburgh Mfg. Co. here, is advertising the sale of the plant and personal property Sept. 18. Real property is valued at $20,000 and personal property $18,000.

CARDINGTON, O.—Operation of the Colonial Mfg. Co. will be commenced shortly.

CLEVELAND—The Ohio Tool Co. was incorporated for $10,000 by Reid M. Kuhns and Roland R. Foley.

COLUMBUS, O.—Fire in the United Surplus Metal Co., formerly known as the New Topper-Goldberg Iron Co., Kimball and North Belle streets, recently damaged the plant with an estimated loss of $75,000. No plans are ready for announcement as yet as to future business of the company.

Machinery Exports

FIGURES recently released by the United States department of commerce, bureau of foreign and domestic commerce, show that the exports of machine tools for the month of July were as follows:

	July, 1923	July, 1922	7 months ended July, 1923	7 months ended July, 1922
Lathes	70	76	497	511
Boring and drilling machines	204	65	1,500	1,030
Planers, shapers and slotters	16	26	91	129
Bending and power presses	14	18	139	147
Gear Cutters	7	37	150	167
Milling machines	13	25	151	189
Thread cutting and screw machines	27	24	670	231
Punching and shearing machines	28	15	248	163
Power hammers	74	12	221	189
Rolling machines	13	20	29	35
Sharpening and grinding machines	1,452	1,062	15,883	7,024
Pneumatic portable tools	987	895	7,190	3,376

DAYTON, O.—Dayton Pump & Mfg. Co., has let the contract to construct an addition to its plant to W. E. Leopold. Work will start immediately.

DAYTON, O.—The Reilly-Barrett Electrical Co. was incorporated with a capital of $30,000 by Daniel G. Reilly, Archie M. Barrett, Frank S. Breidenbach, Julian Tangeman and Nicholas F. Nolan.

DAYTON, O.—The Moraine Products Co., a new subsidiary of General Motors Corp. has been incorporated and will take over and put on a semiproduction basis some of the products which have developed past the experimental stage.

DEFIANCE, O.—The capital stock of the Defiance Automatic Screw Co. has been increased from $15,000 to $50,000.

FOSTORIA, O.—Fostoria Foundry Co., subsidiary of the Electric Auto-Lite Co., did not commence operations Aug. 27 as expected, because of defects in the new blast furnaces. The plant will open as soon as necessary adjustments can be made.

GALION, O.—Plans are being drawn for a 1-story 50 x 160-foot foundry building for the Galion Iron & Mfg. Co. Althan Jones, Market building, is engineer.

LIMA, O.—The Buckeye Casting Co. will

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago** **Detroit**
San Francisco
Cincinnati

increase its capital stock from $25,000 to the $50,000 authorized capital.

LIMA, O.—Holdings of the Lima Coal Co. totaling 1200 acres of West Virginia coal land will be sold at once by Clarence Klinger, receiver of the Lima company.

LIMA, O.—The H. V. Freeman Co. recently was established here to deal in building products such as steel sash, metal lath, and various other metal building material.

LORAIN, O.—Additional property for the erection of new buildings and further expansion are being planned by the Thew Shovel Co., of 30 Church street, New York. The company manufactures gasoline and electric power excavating shovels.

MIDDLETOWN, O.—The Middletown Machine Co. was incorporated recently with a capital of $150,000 by C. W. Shartle and H. D Martingdale. The plant of the Willard-Middletown Machine Co. was recently purchased by the newly incorporated group.

NEWTON FALLS, O.—The Peoples Engineering Co. will erect five new factory buildings, one story each, of steel and tile.

SANDUSKY, O.—The plant of the Roberts Motor Co. in South Sandusky was damaged to the extent of $75,000 by a fire on Aug. 28. The Roberts company manufactures automobile and small boat motors but gained prominence in the war in manufacture of airplane motors.

SPRINGFIELD, O.—L. S. Wegle has purchased the entire interest of the Springfield Welding Works held by C. E. Lawrence and will be in entire charge of the business. No plans for expansion have as yet been made public.

SPRINGFIELD, O.—Production of lawn mowers will be started about Oct. 1 by the Thomas Mfg. Co. here. The concern will make eight different sizes of mowers. It will continue to make its grain drills and haying machinery.

ST. CLAIRSVILLE, O.—County commissioners are taking bids on the erection of a new boiler house, smokestack, tunnels, and equipment.

TOLEDO, O.—DeVilbiss Mfg. Co., has awarded the contract for its new $12,000, 50 x 60-foot boiler house to H. J. Spieker & Son, Elm and Utica streets, Brooklyn, N. Y.

TOLEDO—The Toledo Car Wheel & Foundry Co. has been sold to S. M. Jones Co., to provide for expansion. The Jones company recently completed a machine shop and sucker rod plant.

TOLEDO, O.—Incorporation of the Champion Switch Co., this city, was recently effected with a capital of $500. The incorporators were Wesley H. Brackney, Thomas O. Margler, R. W. Shumaker, A. C. Rumley and Hampton G. Wall.

ALTOONA, PA.—Plans for the erection of a 1-story service and repair building, 25 x 100 feet, are being made by the Davis-Murray Motor Co., 1921 Union avenue. The estimated cost is $100,000.

BUTLER, PA.—C. T. Allme, care Butler Engineering Co. plans the construction of a $50,000, 1-story, 68 x 100-foot factory for a company soon to be formed.

DOYLESTOWN, PA.—It is reported that the Hatboro Stove Foundry and the Roberts & Mander Stove Co. are contemplating the construction of their own water works.

FRANKLIN, PA.—Construction has commenced on an addition to the Venango Mfg. Co., manufacturer of castings, mechanical equipment, etc.

GLASSMERE, PA.—The general contract for a 2-story and basement 105 x 123-foot, $100,000 factory building for the Allegheny Plate Glass Co. was awarded to the Cuthbert Bros. Co., Bessemer building, Pittsburgh.

HAMBURG, PA.—Property adjoining its present site has been purchased by the Hamburg Plow Works, for enlargements. The company manufactures plows and other agricultural implements.

HAWLEY, PA.—Plans have been announced for the immediate construction of a power plant on Wallenpaupack creek in the heart of Wayne county, costing more than $8,000,000. Work will be started at once. The construction will include a dam 1150 feet long.

LANCASTER, PA.—A brick and steel machine shop, a 2-story, 60 x 100-foot $25,000 building, is to be erected on East Fulton street near Shippon street for the Barry Zecher Co.

LEWISTOWN, PA.—A machine shop will be installed by the Lewistown Motor Co. at a cost of about $60,000 to replace the one damaged by fire several months ago.

LYKENS, PA.—The American Briquet Co. will build a $350,000, 1 and 2-story 60 x 220-foot plant of steel and concrete.

MYERSTOWN, PA.—Rebuilding of the Myerstown Foundry & Mfg. Co., will be started as soon as plans can be completed. The plant recently was damaged by fire.

NEW KENSINGTON, PA.—Henry Ford recently renewed a 30-day option on 620 acres of land near here, extending from Harmerville southward a mile and a half. It is rumored that he intends erecting a large steel plant on the site under option.

PHILADELPHIA—The Barclay White Co. has been awarded the general contract on the erection of a $15,000 plant for the John Lang Paper Co.

PHILADELPHIA—Plans are being prepared by the Philadelphia & Reading railroad for an extension to its battery plant at Broad street and Lehigh avenue.

PHILADELPHIA—Bids on the general contract for a new 6-story addition, 100 x 325 feet, for the Budd Mfg. Co., Twenty-eighth street and Hunting Park avenue, have been asked. The company is said to be planning the installation of a number of traveling cranes. It is a manufacturer of steel automobile bodies.

PITTSBURGH—Pittsburgh Malleable Iron Co., Thirty-fourth and Smallman streets, plans the building of a 1-story addition to cost about $150,000 including equipment.

PITTSBURGH—Erection of the superstructure of a 1-story addition to its foundry shop

(*Concluded on Page 696*)

New Trade Publications

PLANT DESCRIPTION—The Mesta Machine Co., Pittsburgh, has published a 65-page booklet, showing illustrations of its plant and a number of products manufactured.

STEEL TRUCK BODY—The McNamara Bros. Co., Baltimore, has issued a folder showing an all-steel body dump truck. A table shows various sizes and the capacities for each.

LIFT TRUCK PLATFORMS—An illustrated folder describing steel and hardwood construction of truck platforms and emphasizing the necessity of centering loads, has been published by the Lewis Shepard Platform Corp., Boston.

USES OF LIME—A 36-page illustrated booklet issued by the National Lime association, Central division, Chicago, describes the part played by lime in the construction of various bridges, towers, elevators, factories and other buildings in the 17 states comprising the Central division.

CHARGING EQUIPMENT—The General Electric Co., Schenectady, N. Y., has published a 12-page illustrated circular describing charging equipment for vehicle motive power batteries. Photographs and descriptions include motor-generator, switchboard and control units and a switchboard layout is given.

RIVETERS—Pneumatic and hydraulic riveters, parts and accessories are described completely with the aid of diagrams and photographs in Catalog No. 5, published by the Hanna Engineering Works, Chicago. Operation of a riveter is pointed out by means of a diagram and photographs show the machine in actual use.

ADJUSTABLE SPEED MOTORS—The Reliance Electric & Engineering Co., Cleveland, has issued a 24-page illustrated catalog describing adjustable speed motors. A sectional view shows the mechanical details of a motor and the parts are photographed and named. A chart of performance curves, table of ratings and general dimensions are included. The last 10 pages are devoted to illustrations of motors in actual use.

CRANES—The Industrial Works, Bay City, Mich., has issued a golden anniversary catalog containing illustrations, engineering data, and performance records of its products. These consist of various types of cranes, pile drivers, portable rail saws, transfer tables, steam pile hammers and buckets. The history of the crane is outlined from the time of the ancient Egyptians who, with their crude implements built the pyramids, up to the present day when a crane capable of lifting a 150-ton load is common. Reproductions and sketches help to give a clear idea of the different stages of development.

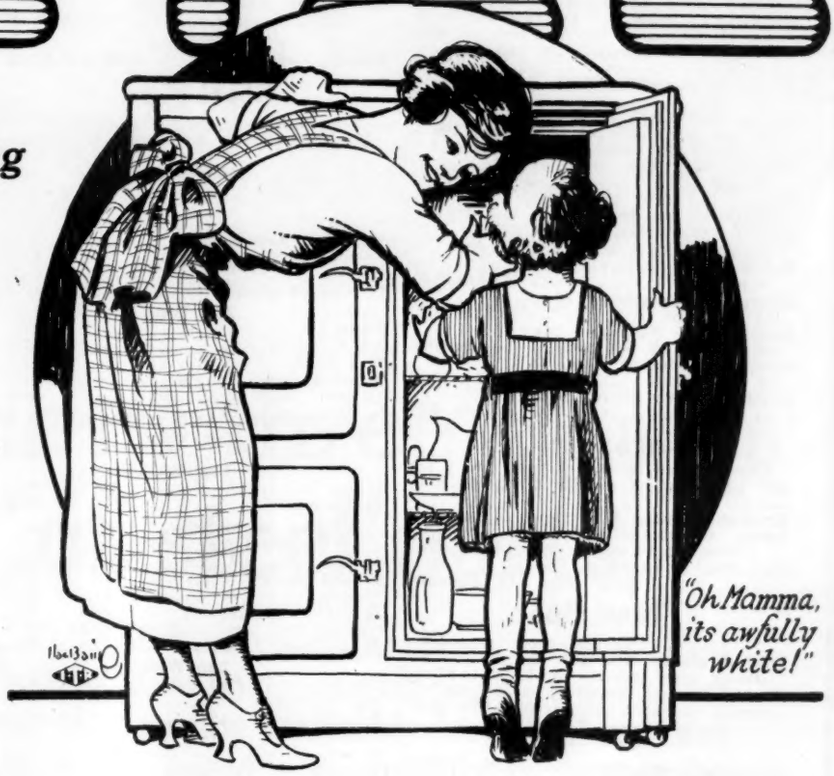
Locomotive cranes are discussed as to parts required, testing of completed cranes and their uses. The various types are taken up individually and their principal features outlined. Various accessories, including buckets, grapples, magnets, generators, lighting and boiler equipment, etc., comprise the next section of the book. Wrecking cranes are built in capacities ranging from 75 to 200 tons and may be steam or electrically driven. These large types are used in railroad operation and heavy construction work and may be equipped with self-propelling mechanism if desired. The book describes the mechanism, design and uses of the wreckers and shows photographs of them doing salvage and construction work. Pillar and transfer cranes, pile drivers, hammers and leaders are treated briefly. A section on cranes for export concludes the book.

WABIK METAL

—the Base for Distinctive Enameling

of

REFRIGERATORS
STOVE DOOR PANELS
SPLASHER BACKS
TABLE TOPS
BROILER PANS
SIGNS
and other flat work



WABIK Metal is a Special Material Specially Treated for Vitreous Enameling. It comes in the form of sheets rolled from our own special "BOTTOM POURED" INGOTS. By using WABIK METAL you will create a bigger demand for your enameled products.

SHEET BARS

INGOTS

Other Mansfield Specialties:—

AUTOMOBILE SHEETS—Body Stock; Flat Fender and Hood Stock; Cowl Stock; Radiator Casing Stock; Crown Fender Stock.

METAL FURNITURE, MILK CAN STOCK, PICKLED AND ANNEALED ENAMELING STOCK for Kitchen Utensils.

Our improved methods in our plants plus the continuous application of the results of continuous study of the steel user's needs, are your guarantee of unusually good service both from our products and ourselves. *May we prove the merits of Mansfield products with a trial order?*

The Mansfield Sheet & Tin Plate Co.

Mansfield, Ohio

DISTRICT SALES REPRESENTATIVES

The L. D. Rockwell Co., 1106 National City Bldg., New York, N. Y.
Mr. D. B. Coey, 1018 Standard Oil Building, Chicago, Ill.
Mr. Geo. W. House, 1822 Ford Building, Detroit, Mich.
The L. D. Rockwell Co., 1512 B. F. Keith Bldg., Cleveland, Ohio.
The Maynard French Steel Co., 516 Mercantile Library Bldg., Cin., O.
Walter G. Clark, Inc., 215-17 Chestnut St., St. Louis, Mo.
Walter G. Clark, Inc., 1317-19 St. Louis Ave., Kansas City, Mo.
Mr. C. H. Beach, 617 Merchants Bank Bldg., Indianapolis, Ind.
Mr. A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.
Mr. Herbert P. Hill, 401 Continental Trust Bldg., Washington, D.C.
Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.
Wm. P. Horn Co., 301 Kerchoff Bldg., Los Angeles, Cal.
Wm. P. Horn Co., Dekum Building, Portland, Ore.
Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.
Mr. Edwin Schofield, 45 Jarvis St., Toronto, Ont., Canada.

East of the Mississippi

(*Concluded from Page 694*)

will be commenced soon by the Standard Sanitary Mfg. Co., Bessemer building, the new plant being 100 x 150 feet and being located on Shipp street, Louisville, Ky.

PITTSTON, PA.—The Hillside Coal & Iron Co. is taking bids on the erection of a new colliery requiring 1200 tons of steel.

PITTSTON, PA.—A portion of the plant of the Pittston Stove Works, William street, was damaged by fire a short time ago. It is planned to rebuild the part which was damaged to an extent of $30,000.

STROUDSBURG, PA.—Plans to remodel and improve the plant of the Pennsylvania Steel & Wire Co., here, secured recently at a receiver's sale by H. S. Myer for the Niagara Steel & Wire Co., Buffalo, are being made by the new owner.

UNIONTOWN, PA.—E. C. Ricks has purchased the Evans Mold & Foundry Co. and will operate it under the name of Ricks Mfg. & Supply Co., specializing in the manufacture of parts for the coal mining industry.

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Mesabi Bessemer, 55 per cent iron	6.20
Old Range nonbessemer, 51½ per cent iron	5.70
Mesabi nonbessemer, 51½ per cent iron	5.55

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent	10.00 to 11.00
Copper free low phosphorus 53 to 65 per cent	13.25 to 16.50

FOREIGN IRON ORE
Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	9.00 to 10.50
Algerian low phosphorus, 52 to 54 per cent	10.00 to 11.00
Swedish and Norwegian low phosphorus, 68 per cent	nominal
Swedish foundry or basic, 66 to 68 per cent	10.50 to 10.75
Spanish foundry or basic, 50 to 54 per cent	8.00 to 9.50

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent	nominal
Indian, minimum 47 per cent	(nominal) 40 to 42 cents c.i.f. tidewater
Caucasian, 53 to 55 per cent	43¾ cents c.i.f. tidewater

Fluor Spar

85 and 5% grade

Washed gravel, Kentucky and Illinois mines, per net ton	$20.00 to $23.50
Washed gravel, imported, duty paid eastern tidewater, per net ton	$19.60 to 20.00

Rivets

Structural rivets, Pittsburgh	3.00c to 3.25c
Rivets, 7/16-in. and smaller	65 and 10 to 65 and 5 off

Nuts and Bolts

NUTS
(Up to 1¼ and 1⅛ inches inclusive)

Hot pressed square or hexagon blank	$3.50 off list
Hot pressed square or hexagon tapped	$3.35 off list
Cold punched square or hexagon blank	3.75 off list
Cold punched, square or hexagon,	3.75 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger	75 and 5 off
Cold punched semifinished hexagon nuts 9/16-inch and smaller	80 and 5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
(¾ x 6 inches, smaller and shorter)

Rolled thread	60 and 5 off
Cut thread	50, 10 and 5 off
Larger and longer	50, 10 and 5 off

MACHINE BOLTS
(¾ x 4 inches, hot pressed nuts)

Rolled thread	60-10 and 5 off
Cut thread	60 and 5 off
Larger and longer	60 and 5 off

(¾ x 4 inches, cold punched nuts)

Cut thread	45, 10 and 5 off
Larger and longer	45, 10 and 5 off
Lag screws	65 and 5 off
Plow bolts Nos. 1, 2 and 3 heads	50 and 10 off
4 to 10 heads	50-10 + 20 off
Stove bolts	75, 10 and 5 off
Tap bolts	25 and 10 off
Bolt ends with hot pressed nuts	60 and 5 off
Bolt ends with cold punched nuts	45, 10 and 5 off
Blank bolts	60 and 5 off
Rough stud bolts with nuts	50, 10 and 5 off

WASHERS

Wrought washers	$5.00 to $5.25 off

Steel Pipe

(Effective April 19, 1923)
Pittsburgh basing discounts, jobbers' carloads.

	Black	Galvanized
Butt Weld		
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)
Pittsburgh basing discounts, jobbers, carloads

THREADS AND COUPLINGS

	Black	Galvanized
Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED
Two points less than above

EXTRA STRONG, PLAIN ENDS

Butt Weld		
⅛ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	..

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap welded)
(Effective April 19, 1923)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
3¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

CHARCOAL IRON
(Effective April 12, 1923)

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¼ to 4½-inch	5

SEAMLESS COLD DRAWN
(Effective April 19, 1923)

1-inch	51 off
1¼ and 1½-inch	43 off
1¾-inch	27 off
2 and 2¼-inch	18 off
2½ and 2¾-inch	28 off
3 and 3¼-inch	32 off
3½ and 3¾-inch	33 off
4-inch	37 off
4½ and 5-inch	29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch	34 off
3½ and 3¾-inch	35 off
4-inch	39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras: ... .

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING
Base Discounts

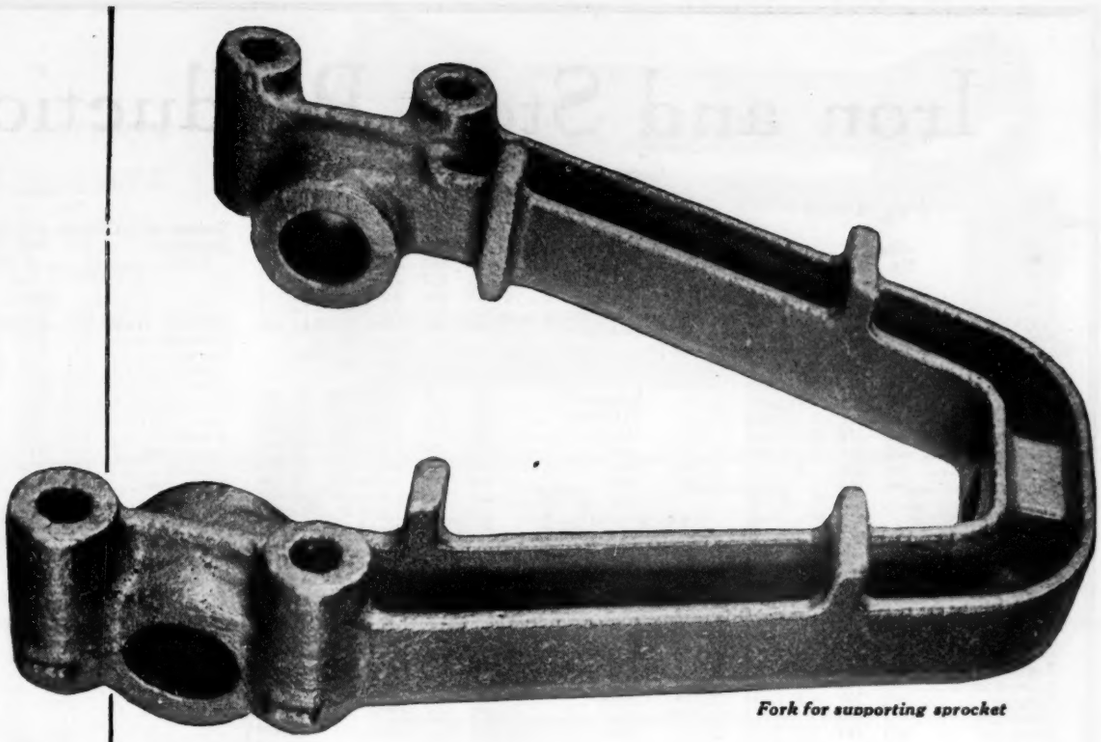
Carbon, 0.10 to 0.20 per cent	83 off
Carbon, 0.30 to 0.40 per cent	81 off
Carbon, 0.40 to 0.50 per cent	net price

Plus differentials and extras for cutting

SEAMLESS STEEL LOCOMOTIVE AND SUPER-HEATER TUBES
(Effective April 19, 1923)
Net prices per foot, f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1¾-inch	9-gage	15c
5⅛-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.



Fork for supporting sprocket

SIVYER (S) CASTINGS

DEPENDABLE

Assuring Interior Integrity

Walls five sixteenths of an inch thin, in conjunction with bearings relatively thick, make it impractical to forge the hanger shown above.

Open hearth practice does not permit the high temperature necessary for pouring sections that vary so much and so sharply.

In Sivyer Electric Steel, however, this hanger is being produced in the uniformly flawless form made necessary by the service and machining demands. The superiority of the electric furnace for certain purposes is, of course, only partly responsible for the successful production of parts like these.

Sivyer molding practice is even more important.

Before producing the casting shown here, it was necessary to make a number by various molding methods; these were sawed through at critical points, and tested in other ways, to make sure that no shrinks or strains occurred in the interior of the castings.

In this way the special molding methods suggested by Sivyer experience and research were thoroughly tested until a practice was established that produced castings uniformly smooth and absolutely sound.

The resulting production showed an exceptionally satisfactory cost for the operations necessary to bore their required seven holes and to machine fourteen faces.

Send Blue Prints

We are especially interested in making experimental castings for manufacturers. If you will send us your blue prints for troublesome parts, together with a statement of your difficulties, we will study the problems involved and recommend possible solutions without obligation on your part.

One of three classes of steel parts

A NUMBER of manufacturers have divided their steel parts into three general classes: those that can be profitably forged; those that cannot be forged economically or cannot be forged at all, but can be cast in ordinary steel; and those that can be cast most reliably and economically in Sivyer Electric Steel. The hanger shown above is one of several parts, in the same assembly, belonging in the last named class. The high temperature at which Sivyer Steel can be poured, the accurate control of its composition, and the thorough molding practice that experience and research have developed, assure uniformly economical machining and absolute interior integrity.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Iron and Steel Production

Compiled By IRON TRADE REVIEW

Pig Iron

	-Stacks- No.	In	——Output—— Total	Av. daily
1907				
January	376	311	2,174,801	70,155
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,249,732	
1908				
January	398	139	1,081,813	34,897
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,718,579	
1909				
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,201
October	413	309	2,589,681	83,538
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,325,099	
1910				
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,768
March	417	310	2,588,736	83,508
April	418	291	2,477,700	82,590
May	419	279	2,374,802	76,607
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,791	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,416
Total			26,845,902	
1911				
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,863
April	421	220	2,044,904	68,163
May	421	206	1,871,388	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	
1912				
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	
1913				
January	423	297	2,787,800	89,929
February	423	306	2,578,670	92,095
March	423	278	2,762,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,816,825	90,865
June	422	283	2,616,883	87,229
July	422	264	2,558,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,494,098	83,137
October	425	244	2,539,924	81,933
November	424	225	2,229,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	
1914				
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	
1915				
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,518	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	
1916				
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	
1917				
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	357	3,238,970	104,483
September	431	342	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	
1918				
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,723
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,778
Total			38,437,488	
1919				
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,120
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	
1920				
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,468
September	434	317	3,124,308	104,143
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	
1921				
January	436	184	2,414,753	77,895
February	436	155	1,929,394	68,906
March	436	103	1,594,866	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,642	27,892
August	436	69	954,901	30,802
September	435	84	985,795	32,859
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	
1922				
January	430	127	1,645,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,035,908	65,674
April	429	161	2,070,161	69,005
May	427	175	2,309,348	74,495
June	427	191	2,362,455	78,748
July	427	170	2,403,030	77,517
August	427	143	1,810,665	58,408
September	427	189	2,024,008	67,466
October	428	218	2,629,655	84,827
November	428	241	2,846,110	94,870
December	428	253	3,083,520	99,468
Total			26,850,844	
1923				
January	428	261	3,228,226	104,136
February	424	278	2,993,918	106,925
March	424	295	3,523,595	113,664
April	423	311	3,547,012	118,233
May	423	322	3,868,486	124,790
June	424	322	3,667,868	122,262
July	418	299	3,684,677	118,860

Ingots and Castings

By American Iron and Steel Institute

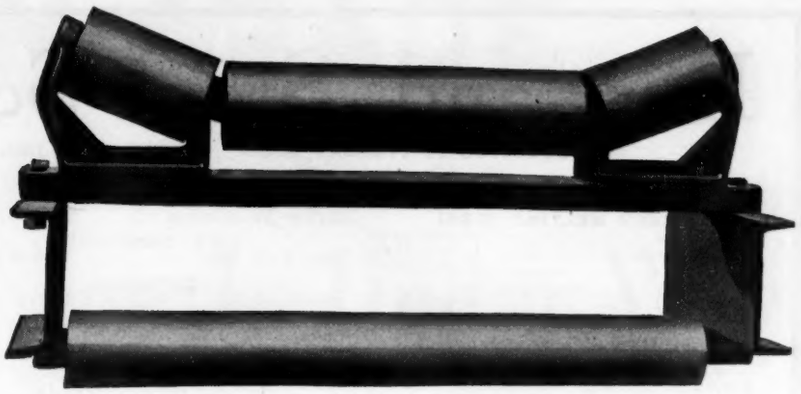
	Ingots	Castings	Total
1918	43,051,022	1,411,410	44,462,432
1919	33,694,795	976,437	34,671,232
1920	40,881,392	1,251,542	42,132,934
1921	19,184,084	559,713	19,743,797
1922	34,568,418	1,034,508	35,602,926

Monthly Ingot Output

Gross Tons

1922	84.15 per cent of capacity	Calculated total
January	1,593,482	1,891,857
February	1,745,022	2,071,772
March	2,370,751	2,814,667
April	2,444,513	2,902,240
May	2,711,141	3,218,794
June	2,634,477	3,127,775
July	2,487,104	2,952,806
August	2,214,582	2,629,256
September	2,373,779	2,818,261
October	2,872,415	3,410,265
November	2,889,297	3,430,309
December	2,779,890	3,300,416
Total	29,116,453	34,568,418
1923	95.35 per cent	
January	3,644,629	3,822,369
February	3,294,264	3,454,918
March	3,858,675	4,046,854
April	3,760,997	3,944,412
May	4,000,695	4,195,800
June	3,574,567	3,748,890
July	3,352,474	3,515,966

Chain Conveyors
Belt Conveyors
Picking Tables
Coal Crushers
Feeders. Etc.



A Conveyor Soon Pays For Itself

Put a Brownhoist conveyor to work on your job and it is a safe bet that your handling costs will show a big drop. Savings made by up-to-date handling methods are putting many companies in the lead of their competitors today.

Brownhoist Belt and Chain Conveyors are backed by nearly a half century's experience in designing and building material handling machinery. During all these years it has been our constant aim to make each Brownhoist product so good that it would be the recognized standard of quality in its field.

An unusually complete line of products enables us to offer unusually good material handling service. When you have any handling problems take them up with Brownhoist.

The Brown Hoisting Machinery Co., *Cleveland, O.*
Branch Offices: New York, Chicago, Pittsburgh, San Francisco, New Orleans

BROWNHOIST

MATERIAL HANDLING EQUIPMENT

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	14.50 to 15.00
Boston (dealers)	12.50 to 13.00
Buffalo	17.00 to 18.00
Chicago	16.75 to 17.25
Cleveland	15.50 to 15.75
Cincinnati	14.50 to 15.00
Detroit dealers)	14.00 to 14.50
Eastern Pennsylvania	16.00 to 17.50
New York (dealers)	12.50 to 13.00
Pittsburgh (dealers)	18.00 to 19.00
St. Louis	16.00 to 16.50
Valleys (nominal)	15.50 to 16.50
No. 1 railroad steel New York (dealers)	13.00 to 13.50

BUNDLED SHEETS

Buffalo	$15.00 to 15.50
Cleveland	11.75 to 12.25
Cincinnati	12.50 to 13.00
Detroit	9.50 to 10.00
Eastern Pennsylvania	14.00 to 14.50
Pittsburgh	16.50 to 17.00
St. Louis	8.50 to 9.00
Valleys	14.50 to 15.00

STEEL RAILS, SHORT

Birmingham	16.00 to 17.00
Boston (dealers)	11.50 to 12.00
Chicago	21.00 to 21.50
Cincinnati	20.00 to 20.50
Cleveland	16.00 to 16.25
St. Louis	17.50 to 18.00

STOVE PLATE

Birmingham	16.00 to 17.00
Boston (consumers)	16.50 to 17.00
Buffalo	17.00 to 17.50
Chicago	18.00 to 18.50
Cincinnati (net tons)	10.00 to 10.50
Cleveland	15.50 to 16.00
Detroit (net)ton (dealers)	13.00 to 1400
Eastern Pennsylvania	17.00 to 18.00
New York (dealers)	13.00 to 13.50
Pittsburgh	16.50 to 17.00
St. Louis	15.50 to 16.00

LOW PHOSPHORUS

Buffalo	23.50 to 24.50
Cincinnati	15.50 to 16.00
Eastern Pennsylvania	22.50 to 23.00
Pitts. billets and bloom crops	23.50 to 24.00

SHOVELING STEEL

Chicago	16.50 to 17.00
Pittsburgh	15.00 to 15.50
St. Louis	16.00 to 16.50

KNUCKLES, COUPLERS & SPRINGS

Chicago	22.50 to 23.00
Eastern Pennsylvania	20.00 to 21.00
Pittsburgh	22.50 to 23.00
St. Louis	20.50 to 21.00

COMPRESSED SHEETS

Buffalo	15.00 to 16.00
Chicago	13.50 to 14.00
Cleveland	14.50 to 15.00
Detroit dealers)	12.50 to 13.50
Pittsburgh	17.50 to 18.00
Valleys	17.00 to 17.25

FROGS, SWITCHES, GUARDS

Chicago	17.00 to 17.50
Eastern Pennsylvania	16.00 to 17.50
St. Louis	17.00 to 17.50

BOILER PLATE, CUT

St. Louis	11.50 to 12.00

ANGLE BARS—STEEL

Chicago	17.75 to 18.25
St. Louis	17.00 to 17.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	14.50 to 15.00
Boston (dealers)	14.00 to 14.50
Buffalo	15.00 to 16.00
Chicago No. 1	18.50 to 19.00
Chicago, No. 2	16.75 to 17.00
Cincinnati No. 1	13.50 to 14.00
Detroit, No. 2	12.50 to 13.00
Eastern Pennsylvania	17.50 to 18.50
Pittsburgh, No. 1	16.00 to 16.50
Pittsburgh, No. 2	18.00 to 19.00
New York, No. 1 (dealers)	15.50 to 16.50
St. Louis, No. 1	16.25 to 16.75
St. Louis, No. 2	17.00 to 17.50

WROUGHT PIPE

Boston (dealers)	11.00 to 11.50
Buffalo	14.00 to 15.00
Eastern Pennsylvania	16.00 to 17.00
New York (dealers)	11.50 to 12.00

YARD WROUGHT

Boston	12.50 to 13.00
Eastern Pennsylvania	16.50 to 17.50

CITY WROUGHT

New York, long	14.00 to 14.50

BUSHELING

Buffalo, No. 1	15.50 to 16.00
Chicago, No. 1	16.50 to 17.00
Chicago. No. 2	12.00 to 12.50
Cincinnati, No. 1	11.50 to 12.00
Cleveland, No. 1.	12.00 to 12.50
Cleveland, No. 2	10.00 to 10.50
Detroit, No. 1	11.50 to 12.00
Detroit, No. 2 (new)	10.50 to 11.00
Detroit, No. 2 (old)	8.50 to 9.00
Eastern Pennsylvania	16.00 to 17.00
Pittsburgh, No. 1	16.00 to 16.50
St. Louis No. 1	16.00 to 16.50

MACHINE SHOP TURNINGS

Birmingham	7.00 to 8.00
Boston (dealers)	8.50 to 9.00
Buffalo	8.00 to 9.00
Chicago	11.25 to 11.75
Cleveland	12.00 to 12.50
Cincinnati	9.00 to 9.50
Detroit (dealers)	9.00 to 9.50
Eastern Pennsylvania	13.50 to 14.00
New York (dealers)	10.00 to 10.50
Pittsburgh	12.50 to 13.00
St. Louis	9.00 to 9.50
Valleys	13.00 to 13.50

CAST IRON BORINGS

Birmingham (chemical)	18.00 to 19.00
Birmingham (plain)	8.50 to 9.00
Boston (chemical)	12.50 to 13.00
Boston (dealers)	8.50 to 9.00
Buffalo	14.00 to 14.50
Pittsburgh	16.00 to 16.50
Chicago	12.50 to 13.00
Cincinnati	9.50 to 10.00
Cleveland	13.00 to 13.50
Detroit (dealers)	11.50 to 12.00
Eastern Pennsylvania	14.50 to 15.50
Eastern Pennsylvania (chem.)	17.00 to 19.00
New York (dealers' price)	10.50 to 11.00
St. Louis	13.50 to 14.00
Valleys	15.50 to 16.50

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	8.50 to 8.75
Cleveland	12.75 to 13.00
Detroit (dealers)	10.75 to 11.25
Eastern Pennsylvania	15.00 to 15.50
New York (dealers)	9.00 to 10.00

IRON AXLES

Birmingham	23.00 to 24.00
Boston (consumers)	31.00 to 32.00
Buffalo	28.00
Chicago	29.50 to 30.00
Cincinnati	22.50 to 23.00
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	27.00 to 28.00
St. Louis	27.00 to 27.50

IRON RAILS

Buffalo	20.00 to 21.00
Chicago	21.50 to 22.00
Cincinnati	14.00 to 14.50
St. Louis	16.00 to 16.50

PIPES AND FLUES

Chicago	11.00 to 11.50
Cincinnati	10.00 to 10.50
Cleveland	10.50 to 11.00
St. Louis	11.50 to 12.00

RAILROAD GRATE BARS

Buffalo	17.00 to 17.50
Chicago	15.25 to 15.75
Cleveland	15.50 to 16.00
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	13.00 to 13.50
St. Louis	15.00 to 15.50

FORGE FLASHINGS

Boston (dealers)	9.50 to 10.00
Chicago, small	11.50 to 12.00
Cleveland, small	13.00 to 13.50
Cleveland, large	12.50 to 13.00
Detroit (dealers)	10.50 to 11.50

FORGE SCRAP

Boston (dealers)	9.50 to 10.00
Chicago	20.00 to 21.00
Eastern Pennsylvania	13.50 to 14.50

ARCH BARS AND TRANSOMS

Chicago	25.50 to 26.00
St. Louis	22.50 to 23.00

ANGLE BARS—IRON

Chicago	26.00 to 26.50
St. Louis	24.00 to 24.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	11.00 to 11.50
Buffalo	17.00 to 18.00
Chicago	13.50 to 14.00
Cleveland	15.50 to 15.75
Eastern Pennsylvania	14.50 to 15.75
Pittsburgh	15.50 to 16.00
St. Louis	14.00 to 14.50

STEEL CAR AXLES

Birmingham	19.00 to 20.00
Boston (consumers)	20.00 to 21.00
Buffalo	24.50 to 25.50
Chicago	21.50 to 22.50
Cleveland	22.00 to 22.50
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	nominal
Pittsburgh	21.00 to 21.50
St. Louis	21.00 to 21.50

SHAFTING

Boston (consumers)	20.00 to 21.00
Chicago	23.50 to 24.00
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	18.50 to 19.00
St. Louis	22.50 to 23.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	18.50 to 19.00
Birmingham, iron	18.00 to 18.50
Boston (consumers)	22.00 to 23.00
Buffalo, iron	16.50 to 17.50
Chicago, iron	19.50 to 20.00
Cincinnati	15.00 to 15.50
Eastern Pennsylvania	20.00 to 21.00
New York iron (dealers)	16.00 to 17.00
Pittsburgh, iron	20.50 to 21.00
Pittsburgh steel	22.50 to 23.00
St. Louis, iron	18.50 to 19.00

NO. 1 CAST SCRAP

Birmingham, cupola	19.00 to 20.00
Boston (consumers)	22.50 to 23.00
Buffalo	19.50 to 20.50
Chicago, cupola	21.50 to 22.00
Cincinnati No. 1 machinery cupola (net tons)	19.50 to 20.00
Cleveland, cupola	21.50 to 22.00
Detroit (net ton) (dealers)	18.50 to 19.00
Eastern Pennsylvania, cupola	20.50 to 21.00
New York, cupola (dealers)	17.00 to 18.00
Pittsburgh, cupola	22.00 to 22.50
San Francisco	26.00 to 28.00
St. Louis, railroad	20.50 to 21.00
St. Louis, agricultural	20.50 to 21.00
Valleys	20.00 to 21.00

HEAVY CAST

Boston (consumers)	20.00 to 21.00
Buffalo	16.00 to 17.00
Cleveland	15.00 to 15.50
Detroit (automobile) (net)ton	21.00 to 22.00
Eastern Pennsylvania	18.50 to 19.50
New York (dealers)	16.00 to 16.50
Pittsburgh	19.00 to 19.50

MALLEABLE

Boston (railroad) (consumers)	22.00 to 23.00
Buffalo	20.00 to 21.00
Chicago, railroad	22.00 to 22.50
Chicago, agricultural	18.00 to 19.00
Cincinnati, agricultural	15.50 to 16.00
Cincinnati, railroad	17.00 to 17.50
Cleveland, agricultural	20.50 to 21.00
Cleveland, railroad	21.50 to 22.00
Detroit (dealers)	19.50 to 20.50
Eastern Pennsylvania, railroad	17.00 to 17.50
Pittsburgh, railroad	20.50 to 21.00
St. Louis, agricultural	19.00 to 19.50
St. Louis, railroad	19.00 to 19.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	17.00 to 17.50
Boston (dealers)	14.00 to 14.50
Chicago	18.25 to 18.50
Cleveland	20.00 to 20.50
Detroit	14.00 to 14.50
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	14.00 to 14.50
Pittsburgh district	19.50 to 20.00
St. Louis	17.50 to 18.00

LOCOMOTIVE TIRES

Chicago	18.50 to 19.00
St. Louis	17.00 to 17.50

LOW PHOSPHORUS PUNCHINGS

Chicago	19.00 to 19.50
Eastern Pennsylvania	22.50 to 23.00
Pittsburgh	21.50 to 22.00